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JOURNAL *of the* AMERICAN DIETETIC ASSOCIATION

A REVIEW OF RECENT STUDIES OF THE CAUSE OF DENTAL CARIES[1]

MARTHA KOEHNE, PH.D., RUSSELL W. BUNTING, D.D.Sc., AND FAITH P. HADLEY, M.S.

THERE is considerable confusion today concerning the rôle of diet in the cause and prevention of tooth decay. A mass of literature has become available since the publication of a review of this subject in 1932 (40). Several summaries of recent work have been published (3, 9, 16, 20, 23, 36, 51, 58). In 1930, Bunting and coworkers (10) summarized the chief characteristics of caries. Only when the problem of its etiology has finally been solved, can all of these facts be satisfactorily explained.

The chief handicap in the solution of the problem has been lack of a suitable experimental animal, whose teeth are shaped and arranged like human teeth and whose food habits resemble ours. None of us would wish to assume the responsibility for placing children on *deficient* diets for a sufficiently long time to study the effects of such diets on caries incidence. Many contemporary reports are based on attempts to cause or prevent caries in the molar teeth of rats by dietary measures. Confusion has resulted from frequent failure to distinguish between true caries, and disintegration that begins with fracture, or in dentin which has been exposed by the wearing down of the enamel of the molar cusps. Rosebury (51, 54, 55) has recently outlined criteria which should help in deciding whether or not caries found in a rat molar is comparable to the human disease.

The intense interest in the subject has also been somewhat of a drawback. Some who have attempted to contribute to the solution of the

[1] The work reported in this paper as coming from the University of Michigan is part of a group research in the cause of dental caries that has been conducted in the School of Dentistry under the auspices of the Children's Fund of Michigan. Read before the American Dietetic Association, October 12, 1933.

problem have had either inadequate laboratory facilities or a vague knowledge of biochemistry. Conclusions have too often been based on insufficient evidence. In many of the reported studies on children, too few criteria have been used in judging the significance of the clinical findings. Frequently the periods of observation have been too short, with no clinical reports previous or subsequent to the experimental period. There is a scarcity of evidence based on correlation of well-controlled biochemical, nutritional, bacteriological and dental studies of children under observation for long periods. Such work is time-consuming, and to support a large staff and well-equipped laboratory requires considerable money.

Many who are conducting research in this field believe that susceptibility to dental caries is caused primarily by forces working within the tooth. They regard the bacterial flora of the mouth, and other local factors as of minor importance compared with the regular intake of a well-balanced diet. One group (7, 12, 21, 22) believes that such diets are successful because they improve the general resistance of body tissues. A second group, believing that erupted teeth behave like bone in many respects, is convinced that the secret of caries prevention lies in providing conditions suitable for normal metabolism of calcium and phosphorus. Such conditions are said to insure the maintenance of a highly resistant back wall of secondary dentin (47, 7, 12, 57). Others in this group (1, 38) believe that the greatest emphasis should be placed on maintaining normal concentrations of phosphorus in the blood serum. A third group (27, 20, 22) place considerable emphasis on the regular intake of large amounts of vitamin C as part of an otherwise well-balanced diet, to prevent deterioration of dentin and pulp, and subsequent increased susceptibility to caries.

Perhaps the majority of those who are at present studying the cause of tooth decay believe that the initial process is brought about by the action of acid on the surface of enamel. There is strong evidence, as will be shown later, in support of their belief that this acid is formed on protected areas of tooth surface by the growth thereon of microörganisms. Bacillus acidophilus is regarded as the principal organism involved, for it is capable both of fermenting carbohydrate to form lactic acid and of living in concentrations of acid represented by a pH as low as 3.2. Evidence has been submitted (32, 42, 43) that there are persons in whose mouths and intestinal tracts Bacillus acidophilus seems unable to grow, even after repeated inoculations. Such persons have been found to have teeth free of cavities, even though, in some instances, their diets have

been inadequate according to generally accepted nutritional standards. Most persons, however, have experienced tooth decay. In their mouths Bacillus acidophilus is usually present. The concentration of this organism in the saliva, and whether it is constantly or only intermittently present, are directly related to the degree of susceptibility of the individual to the disease (19, 32, 42, 43).

The advocates of the primary rôle of this microörganism in the production of tooth decay differ among themselves as to the part that the kind of food eaten and the general metabolism play in increasing or arresting natural susceptibility to caries. Most of them have expressed the belief that the regular use of diets that provide all nutritive essentials in reasonable amount will, in some way or other, protect against the disease. One group believes that such a diet protects against caries by the maintenance of normal alkaline reserves in the blood (6, 49). Bödecker assumes the existence of a dental lymph that concentrates the acid-neutralizing properties which it absorbs from the blood, circulates to the enamel surface and neutralizes acids formed there by bacterial fermentation. Another group believes that it is through the saliva which is constantly bathing the teeth, that protection must come. Advocates of this theory assert that the use of a nutritionally adequate diet will insure the production of saliva high in acid-neutralizing power and in calcium and phosphorus (15, 24). Hawkins asserts that, under suitable conditions, calcium salts in saliva may be deposited in spaces between the enamel rods, thus decreasing the permeability of the enamel surface.

Very recently evidence has been accumulating that seems to point to the possibility that diet enters into the problem, *not through its systemic influence on metabolic processes*, but through the *effect it exerts locally* in favoring the growth of these aciduric microörganisms. Food may exert such an influence, either by the nature of residues left clinging to the teeth, or through the pabulum provided in the intestinal tract. Children living in a certain orphanage who, for a long time, had been on a diet nutritionally below accepted standards were found to be singularly free from caries (43). Rats have been fed deficient diets without resultant caries (44, 53, 54). Caries has been produced experimentally in children (42) and in rats (26, 59) on diets that were nutritionally satisfactory according to present standards.

Other evidence indicates a future *possibility* of controlling susceptibility to caries by the application of immunological principles (32).

Recent Evidence of the Relation of Bacillus Acidophilus to Caries Incidence: A recent report (32) offers a detailed review of the bacterio-

logical evidence in support of the primary causal relation of this organism to caries activity. Only a brief summary of recent work will be attempted in this paper.

Investigations have been reported indicating that Bacillus acidophilus is not primarily responsible for the disintegration of enamel found in caries. Lilly (44) refused to recognize a causal relation between this organism and caries because he fed a "pure culture" of Bacillus acidophilus to rats, and no caries resulted. He did not state the source of the pure culture used. Evidence has been submitted (32, 50) that the strain of Bacillus acidophilus found *normally* in the mouth of the rat differs somewhat from human strains. In any event, the organism must be *growing* in the body before it can be held responsible for causing damage to the teeth. Lilly failed to include evidence that he had succeeded in infecting his rats with the organism introduced. Jay and coworkers (32) describe an experiment in which a pint of acidophilus milk was fed daily to each of 6 caries-free *children* for 1 week. At the end of this time, repeated quantitative tests made on their saliva failed to demonstrate the presence of Bacillus acidophilus in the mouth. Within 2 weeks, all traces of the organism had disappeared from the stools.

Hanke and colleagues represent another group which minimizes the importance of Bacillus acidophilus in initiating cavities. Bacillus acidophilus was found *most frequently and consistently* (21, 22) in cases where there were 3 or more cavities. However, it was also found rather frequently and consistently in cases where no caries was present or where the process had been inactive for 2 years. Therefore they assert that this organism bears no specific primary causal relation to the disease. The bacteriologic tests made on the salivas of the children were all qualitative, and not over 2 results have been reported for any 1 child during the 3 years of the experiment (22). Boyd and Drain (7, 12) are of the same opinion as Hanke and colleagues. They, too, have reported only qualitative findings and have submitted no detailed evidence—qualitative or quantitative—for the same persons studied over long periods of time.

Since December 1931, tests for the presence or absence of Bacillus acidophilus in saliva, conducted at the School of Dentistry, University of Michigan, have been of a *quantitative* as well as of a qualitative nature. The quantitative method which was used has recently been reported by Hadley (19), the qualitative, by Jay and Voorhees (31). The advantages of the quantitative over the previously available qualitative method are apparent. If a portion of saliva to be added to nutrient

TABLE 1

Bacteriological records that illustrate the quantitative relationship between the concentration of Bacillus acidophilus in the saliva and susceptibility to dental caries

	NUMBER OF CHILDREN	OBSERVATION PERIOD	TOTAL TIMES TESTED	NUMBER OF NEGATIVE QUALITATIVE TESTS	NUMBER OF NEGATIVE QUANTITATIVE PLATES	CONCENTRATION OF B. ACIDOPHILUS IN THE SALIVA (NUMBER PER CUBIC CENTIMETER OF SALIVA)		
						Average	Minimum	Maximum
Immunes	1[a]	260 days	24	24	24			
	1[a]	27 days	2	2	2			
		97 days	10	7	7	335	150	600
	1[a]	63 days	3	2	2			42,400[d]
		110 days	18	18	18			
		106 days	10	10	10			
	9[b]	1½ yrs.	54[h]	20	27	122	3	779
Caries-inactive	3[c]	1½ yrs.	39[h]	39	39			
	9[c]	1½ yrs.	115[h]	104	115			
						52		370,000
	4[c]	1½ yrs.	52[h]	42	48[e]	400		19,825
Developing inactivity	1[c]	1½ yrs.	13	8	8[f]	27,925	8,700	75,000
	1[a]	75 days	9	2	2	83,700	1,600	446,100
		75 days	10	6	6	2,545	80	8,100
Developing activity	1[c]	1½ yrs.	11	8	8[g]	52,000	11,700	121,600
	1[a]	75 days	8	5	8			
		120 days	7	0	3	5,280	60	18,000
		105 days	14	0	2	236,500	2,000	1,464,000
Constant activity	1[c]	1½ yrs.	13	0	1	52,500	100	288,000
	1[a]	70 days	10	0	0	244,480	60,000	648,800
		56 days	8	0	0	919,100	7,200	3,000,500
	9[b]	1½ yrs.	54[h]	0	0	68,776[e]	7,250	237,400

[a] Children in University Hospital group (42)—days indicated are consecutive.

[b] Children in Ann Arbor school group (19, 28).

[c] Children in orphanage group (43).

[d] This was the first test made, and the only positive one. The high count may have been due to temporary contamination of the mouth from food.

[e] Each of the four children had one positive plate in the series, each of these counts are given.

[f] The five positive plates were found during the first four or five months, all subsequent plates and broth cultures were negative.

[g] The three positive plates were all found during the last five months.

[h] This figure represents total number of tests.

broth contained only one or two aciduric organisms, subsequent incubation would give positive results quite similar to those obtained when the amount of saliva used contained these organisms in considerable numbers.

In table 1 will be found a summary of results obtained in the study of a few of the children whom we have had under observation. The subjects are classified according to activity of caries *while under observation*, not by the appearance of the mouth on first examination. As will be seen in the records of those termed immunes and caries-inactives, occasional positive quantitative plates and qualitative tests were found in the saliva. Likewise, occasional negative results were obtained in studies of the salivas of those who were constantly susceptible or who were developing susceptibility. The general bacteriologic picture, however, is radically different, both qualitatively and quantitatively, for those representing the above noted extremes in caries activity.

Lack of correlation between susceptibility to caries and the concentration of Bacillus acidophilus in the oral fluid of rats at autopsy, and in the salivas of a few children was recently reported (33). The method used was not the same as that employed in our laboratory where the Hadley method has not been used for studies with rats. We have, however, found (32) that the presence of Bacillus acidophilus in the rat mouth is of significance only when the diet used is fermentable and becomes impacted in the molar sulci in a form moist enough to permit fermentation. In their work with children, Johnston and colleagues have reported only 2 determinations on the salivas of children, these determinations being separated by intervals of 1 year. They reported only 1 set of figures representing the concentration of aciduric organisms in the salivas of the children and give only 1 set of dental findings. They neglected to state whether the data reported represent findings at the beginning or close of this year. They failed to state whether the samples were collected at *uniform* times with respect to meals. This is of importance in view of the possibility of temporary contamination of the mouth from food. With such incomplete evidence available, comparison of their results with ours is impossible.

When the Hadley method was used *frequently* in the study of salivas of the *same individuals* over *long periods of time*, during which close observations were made of the progress of caries activity, results similar to those recorded in table 1 were found in the majority of cases. Our experience has been that the clinical findings correlate very closely with the bacteriologic picture in 85 per cent or more of the cases studied. In several of our groups of children, we have found a very small number of cases in whom caries activity was associated with a bacteriologic picture characteristic of caries inactivity (42, 43). We have offered no explanation for these exceptional cases, although there are several possible ones.

Relation of Composition of Blood Serum and Saliva to Caries Incidence: We shall limit ourselves here to a brief summary, since this phase of the subject will be discussed in greater detail. in a review by the authors for Volume III of the *Annual Review of Biochemistry.* The existence of demonstrable differences between those susceptible to caries and those in whom the disease is inactive, either in the acid-neutralizing power of blood serum or in its calcium or phosphorus content, is fundamental to the concept of caries expressed in certain publications (6, 49, 1, 39). Strong evidence against the existence of such differences has been submitted (34, 21, 22, 28).

Hawkins (24) and Forbes (15) have been the leading advocates of a positive relation between the available acid-base and the calcium-phosphorus content of the diet, the composition of saliva, and caries susceptibility. Evidence in opposition to various aspects of such a relationship has been submitted by several investigators (11, 21, 22, 8, 34) and also by our group (19, 28, 29, 41, 42, 43). We have therefore been forced to conclude that resistance or susceptibility to caries bears no specific relation either to the calcium and phosphorus content of blood serum or saliva, or to their acid-neutralizing power. As a result of our studies we believe that, under conditions of ordinary health, the composition of saliva as related to these constituents fluctuates only within a narrow range with changes in diet.

Relation of the Nutritional Balance of the Diet to Caries Incidence: Because of fundamental objections, no attempts have been made to date to produce cavities in the teeth of children by limiting them to diets deficient nutritionally in one or more respects. There are, however, countless children living in private homes and in institutions whose diets are definitely inadequate according to present nutritional standards. It is a well-known fact that the nutritional balance of the diet is closely related to normal tooth and bone development. It is also generally recognized that interferences in intake or utilization of calcium and phosphorus may bring about decalcification of bone. Because of these facts, it has been commonly accepted that, in some way or other, diets poorly balanced nutritionally encourage the decalcification of enamel found in caries. If many cavities are found in the teeth of a person and the diet is inadequate, it has been assumed that the poor nutritional balance of his diet caused the dental condition. It is not uncommon to find that some of these persons are *eating* foods that are apparently adequate nutritionally. On the other hand, there are many who have never had decayed teeth whose diets are poorly balanced (43). Solution of the

problem of the cause of tooth decay must provide adequate explanation of these facts. Mellanby in England, by means of deficient diets, has produced teeth, in dogs, which showed all degrees of hypoplasia, yet she has never succeeded in producing cavities in them.

In our report of experiments on children (42), we have submitted evidence that caries *was produced* in children *eating* diets generally recognized as satisfactory for normal growth and well-being. Quantitative records were kept of the daily food intake of each child throughout the period of observation. Analyses of blood serum, studies of calcium and phosphorus retention (30), and close medical observation for long periods of time, indicated that the metabolic processes were normal. Their healthy appetites, normal gains made in height and weight, and general behavior showed them to be normal children (41, 42).

There are numerous reports of attempts to produce caries in the teeth of rats by restricting them to deficient diets. Most of these experiments have been motivated by the desire to prove or disprove the relation of caries incidence to calcium and phosphorus intake and to their metabolism as influenced by vitamin D. Grieves, working with McCollum, early reported (18) the production of caries within 120 to 150 days in 17 to 31 per cent of rats whose diets were deficient in one or more of certain dietary factors; namely, calcium, protein, and vitamins A and D. Grieves said that rachitic and caries-like lesions were seldom coëxistent. Agnew, Agnew and Tisdall (1) report reduction in incidence of caries in rats when diets low in phosphorus and vitamin D were adequately supplemented. They consider the calcium content of the diet as of little importance in the production of caries. Close study of their data fails to reveal the constant parallelism, which they consider fundamental, between blood phosphorus and caries susceptibility. We await final report of their studies on the effect of vitamin D administration on caries incidence in a large number of institution children in Toronto. Blackberg and Berke (4, 5) report $33\frac{1}{3}$ per cent caries incidence in rats that were fed rachitic diets. These diets, however, contained a high percentage of corn which, if coarsely ground, might explain, as will be shown later, the production of caries noted. Failure to produce this disease in rats on *synthetic* rachitic diets has been reported (44, 53, 52).

McBeath (45), as a result of experiments on institutional children who were under observation for 2 years, believes that vitamin D is the most important single protective factor. Mellanby has advocated such a relationship for a long time (47). These experiments have all been of short duration and the reports have failed to give data on caries incidence

among these same children previous or subsequent to the periods of vitamin D administration. The best results were obtained with the group of young children who averaged 5.4 years old.

Efforts have been made to determine whether children, known to have had rickets in infancy and early childhood, had a higher incidence of caries than children who had not had rickets. Greenbaum and Selkirk (17), studying 2 such groups of children 6 to 7 years old, reported twice as much caries in the rachitic as in the non-rachitic group. Kirsch and Rosenbaum (37) reported a caries incidence ratio of 1:13 in the permanent teeth of a group of normal children, compared with 1:2 in a rachitic group. Eliot and colleagues (13) studied the teeth of 215 children who had never had rickets, 108 who had had very mild evidences of rickets as infants, and 128 who had had moderate or severe rickets. Their ages at the time of examination ranged from 5 to 12, the majority being 6 to 8 years old. Caries was found in 63 per cent of the children in the rachitic group, compared with 43 per cent caries incidence among those having a history of very mild or no rickets. The incidence of caries in children with hypoplastic enamel was practically the same as in those having normal teeth. Twice as much caries was found in the six-year molars of the white children as in those of the Negro children. In commenting on this report, Hess told of his study of the incidence of caries in 200 white and 200 Negro children. The teeth of the Negro children showed much less decay, in spite of the fact that the incidence of hypoplasia was much higher among the Negro children who came from a district known to have more rickets than any other in New York City. Hess and Abramson (25) in a study similar to that of Eliot and colleagues but involving a smaller number of children, had previously reported finding a negative relationship between early rickets and later susceptibility to caries. In this report they also called attention to the prevalence of caries in the tropics where rickets is rarely found. Similar evidence may be found in Mitchell's report (48) of caries incidence in urban and rural children in Puerto Rico. Evidence of a lack of relationship between caries in early childhood and subsequent susceptibility to it has also been submitted (46).

Other Constituents or Properties of Diet that May Be Related Specifically to the Cause of Tooth Decay: Shibata (60) was the first to produce caries in rat molars in a short period of time; 20 days in some cases. The diet used was brown rice and spinach. More recently, Hoppert, Webber and Canniff (26) reported successful production of caries in rats in 8 weeks' time. The diets used were adequate for normal growth and

TABLE 2

Record of attempts to produce caries in rats on adequate diets

	RATION 1	RATION 2	RATION 3	RATION 4	RATION 5*
	(*per cent by weight*)				
Casein, commercial	18.0	18.0	14.0	74.0	
Lard	20.0	5.0	20.0	20.0	
Sucrose	56.0	71.0	30.0		
White flour			30.0		
Salt mixture (185)	4.0	4.0	4.0	4.0	
Agar	2.0	2.0	2.0	2.0	
Supplements:					
Lettuce	Approx. 3 to 5 grams three times a week				
Cod liver oil	Approx. 50 mgm. six times a week				
Dry yeast	Approx. 0.7 gm. 6 times weekly				
Percentage distribution of caloric intake:					
Protein	15.0	18.0	15.0	62.0	
Fat	38.0	11.0	39.0	38.0	
Sucrose	47.0	71.0	25.0		
White flour			21.0		
Aver. daily food consumed in last 97–127 days (grams):					3.7(F)
Males	12.2	14.0	12.8	10.0	10.8
Females	9.7	11.5	10.7	7.8	9.0
					2.5(F)
Aver. gains in weight in 280–325 days (grams):					
Males	283	280	322	237	317
Females	183	190	213	165	205
Total number of rats (all young)	10	10	10	15	10
Incidence of caries	None	None	None	None	1

	RATION 6	RATION 7	RATION 8	RATION 9	RATION 10
	(*per cent by weight*)				
Powdered rice	66.0				
Coarse rice		66.0	66.0	66.0	64.5
Whole milk powder	30.0	30.0	30.0	30.0	30.0
Alfalfa meal	3.0	3.0	3.0	3.0	3.0
NaCl	1.0	1.0	1.0	1.0	1.0
$NaH_2PO_4 \cdot H_2O$					1.5
Daily supplements:					
Dry yeast (grams):					
Unirradiated				0.7	
Irradiated			0.7		
Mgm. viosterol 2D					80–130
Analysis of ration (per cent):					
Total ash	3.31	3.68	3.68	3.68	4.02
Calcium	0.44	0.43	0.43	0.43	0.40
Phosphorus	0.46	0.46	0.47	0.47	0.80
Analysis of serum (mgm. per 100 cc.):					
Calcium (min.)		12.6	11.7	10.4	10.8
(max.)			12.2	10.9	11.7
Phosphorus (min.)		9.7	8.9	9.4	10.3
(max.)		9.8	9.7	10.2	11.8
Aver. gains in weight in 71–77 days (grams):					
Young males		195	193	125	129
Young females		113	95	88	61
Total number of rats:					
Adult	2	1	1	1	2
Young	6	6	6	6	6
Incidence of caries	None	All	All	All	Seven,1 adult neg.

* Each rat had two food cups in its cage (Ration 5). One cup contained Ration 3, the other contained dry powdered fudge (F).

well-being, the caries-determining factor being the particle size of the cereal used. Their work has been repeated in our laboratories. Data included on the right half of table 2 show the daily supplements given to the animals, the constituents of the rations, together with their content of total ash, calcium and phosphorus as determined by analysis.[2] In Ration 6 the rice was pulverized to powder fineness. The coarse rice, used in the other four rations, was ground in Hoppert's laboratory in East Lansing. The size of the particles was about the same as those found in fine sand. Neither vitamin D, as found in irradiated dry yeast, nor a combination of viosterol 2 D and extra phosphorus could protect the rats from caries when fed rations in which the rice was coarsely ground. None of the animals on Ration 6 developed cavities. Chemical analyses of pooled samples of blood serum showed normal values. Our results in table 2 confirm those of Hoppert, Webber and Canniff. Somewhat similar findings have since been reported (39) with diets containing 1.2 parts of calcium and 0.23 of phosphorus, per 100 grams of ration, and less satisfactory nutritionally than the Hoppert diet.

Still more recent confirmation of the theory that the physical consistency of the diet is of greater importance in producing caries in rat teeth than is its chemical composition will be found in the work of Shelling and Asher (59) and Rosebury, Karshan and Foley (56). Shelling and Asher state that Agnew, Agnew and Tisdall (1) have produced similar evidence, although their own conclusions, from experiments, support the phosphorus-vitamin D-deficiency theory as the cause of the cavities found. According to Shelling and Asher's analysis of the Agnew data, 383 rats in all were fed on *cornless* diets. Of this number only 5 developed caries. Of the 121 rats limited to diets containing high percentages of corn, for periods varying from 2 to 8 months, 112 (93 per cent) developed cavities. However, in response to an inquiry from us several months ago, concerning the fineness of the corn used, one of the group (F. F. T.) replied that it had been ground to flour-fineness. If so, the Shelling and Asher explanation of their findings, although interesting, would have little significance in view of the negative results generally obtained with diets containing finely ground corn or rice.

Hoppert has said, in our laboratory, that when all of the rice or corn in the diets was coarse, no caries resulted; but if the cereal was incorporated in the ration in the form in which it came from the mill, part fine and part coarse, caries was invariably observed. Hoppert at this

[2] Chemical analyses of rations and of blood serum were made by R. B. Hubbell.

time advanced a theory to explain the protection provided by the fine diet. He stated that solidly-packed portions of the fine diet had been found to be relatively impermeable to fluids, while similar packs of the coarse diet permitted free access of fluids. If the material packed in the sulci of the lower molars is impermeable to oral fluids, its bacterial decomposition will be impossible, because of lack of moisture. The material we were able to dislodge from such locations in the teeth of rats on the fine diet, Ration 6, was dry and cement-like in appearance, in marked contrast to that found impacted in similar areas in the teeth of rats on the coarse diets.

In his excellent review, Rosebury (51) says: "Some factor concerned with the character of the diet is of importance in susceptibility to caries; the incidence of caries in children may be reduced by regulation of the diet, and typical caries may be produced in rats by dietary means; it now appears likely that this dietary factor is physical rather than chemical, acting locally in the mouth rather than through the agency of a dietary deficiency; but such a deficiency may contribute to the process."

Our studies (42) showed that caries was produced in 9 out of 13 children on adequate diets, for periods of 4 months to 1 year. The *extra* caloric intake during this period, in the form of sweets, seemed to be the determining factor. Three others of the group of 13 who were given candy *ad libitum* had never had cavities in their teeth. Their saliva and stool cultures were rather consistently negative for Bacillus acidophilus, and no cavities were formed in their teeth during the high sugar-feeding period. They probably represent a small group who are naturally immune to this disease and who remain free from tooth decay regardless of what they eat. The home diets of the 3 children referred to, before admission to the hospital, were deplorably deficient nutritionally.

Nine out of a group of 14 who were on similar diets, except that they were not permitted to have access to extra sweets, showed arrested caries. The remaining 5 continued to be highly susceptible, in spite of low sugar intake and maintenance on diets that were satisfactory nutritionally. It is possible that strict limitation of both starch and sugar intake would have improved the dental and bacteriological pictures in these children. We have evidence that a long-maintained high concentration of aciduric organisms in saliva will drop to almost zero within a few days after restriction to this type of diet (19, 42). In our own studies the subjects have not been willing to stay on such a diet long enough to permit a study of its effect on reducing caries susceptibility. Drain and Boyd (12) have reported the remarkable success of diabetic diets in arresting the progress

of caries in some of their patients. If the interesting attempts (32) to confer immunity by vaccination ultimately prove to be successful and practical, there will be hope of saving the teeth of persons highly susceptible to caries, without so much personal sacrifice.

In our studies of orphanage children between the ages of 6 and 18 years (43), we found caries inactive in 57.1 per cent of 49 children over a period of $2\frac{1}{2}$ to $4\frac{1}{2}$ years, and in 71.5 per cent of 109 children for a period of $1\frac{1}{2}$ years; yet for 6 or 7 years the institution diet had been definitely deficient according to generally accepted standards. Forty per cent of 201 children of these ages, who had lived in the institution for an average of 4 years were stunted in height, according to the Woodbury standards. This condition was especially prevalent among those past 9 years of age. Only a small percentage of the children could be called natural immunes. The great majority had had cavities on admission. A surprisingly large percentage of these children ceased to have new cavities after coming to live in the institution. We could explain the low incidence of caries only by the very low intake of artificially sweetened food, and by the absolute uniformity in type of meals served and the regularity in their service.

In our studies of Ann Arbor school children we were able to collect dependable information on the present food habits and early nutritional history of 9 who remained free from caries during the 18 months' period of our studies, and for 9 others who remained actively susceptible. These numbers are small and the findings may be of little significance. However, we are submitting them for what they are worth.

All of the 9 caries-free children had excellent appetites. They were not at all notional about food and their meals were of uniform quality and served regularly. In the susceptible group, 8 were either notional about what they ate, or their meals were irregular both as to type of food eaten and time, or the families were too poor or careless to serve suitable food to them. One child had fairly good food habits. One of the caries-free children was allergic and could not drink milk (except a small amount, boiled or evaporated); egg, wheat, and many fruits and vegetables could not be eaten. His mother did her best to provide him with suitable food. He did not object to monotony and was very cooperative. Fruits, vegetables and milk were partaken of more generously and regularly by the caries-free children. Three in the susceptible group took very little milk; 2 used almost a quart per day.

Most of the caries-free children ate candy and simple desserts occasionally. Some of the mothers said that they always had candy in the house but that the children rarely ate it. They ate very well at their

meals, which were well-balanced in general, and satisfying, and there was not the constant craving for food between meals so often seen in children with poor food habits. The majority of the children that were susceptible to caries, ate poorly at the table and tried to satisfy their craving for food between meals with sweets and similar types of food. Is it possible that the advantage of a well-balanced diet in the prevention of caries lies in the fact that when such a diet is eaten in adequate amounts, there is little room or desire for sweets?

Mellanby and Pattison (47) say that high cereal intake, especially of oatmeal, interferes with normal calcium and phosphorus metabolism by increasing the need for vitamin D, thus favoring the production of caries. Hawkins (24) asserts that high cereal intake encourages cavity formation because part of the gluten of wheat deposits as film on the teeth. Yet our orphanage children have been surprisingly free of caries on diets in which from 40 to 45 per cent of the calories were derived from starch, mostly from cereals. Eskimos on their native carbohydrate-free diet have perfect teeth. Many primitive peoples whose food is limited to a small variety of simple natural foods are likewise free of caries. That such people are not naturally immune to this disease is evidenced by the rapid rate at which their teeth disintegrate after contact with civilization. Clara Davis has said[3] that she found no caries in the teeth of the children in her exp rimental group in Chicago. The supposedly "free choice" of food by these children is limited to a list of plain natural foods, originally selected by herself. Artificially sweetened or flavored foods are never placed on their trays.

During the past year much publicity has been given to the statement that sugar has been absolved of all responsibility for causing tooth decay. This supposition was based on the fact that Lilly (44) failed to find caries in the teeth of rats that were on high sugar diets for one year. Data will be found in table 2 of similar experiments conducted by our group several years ago but heretofore unpublished. We, too, obtained negative results which can probably be explained by the principles outlined in the discussion of the work of Hoppert and colleagues. The constituents of the rations were finely divided, and sucrose is much more readily soluble than is cereal. Carbohydrate residues probably did not remain in the mouths of these animals long enough for fermentation to take place. Such findings can in no way discredit the data submitted in the report of our studies on the children at University Hospital (42).

[3] Personal communication.

Diets that have been found successful in controlling caries in the normal patients of Hawkins, Drain and Boyd, Hanke, and others have contained very moderate amounts of highly sweetened food. The celiac patients of Drain and Boyd who showed arrested caries on high sugar diets, drank dextrose solutions.

Austin and Vinson (2) recently reported finding perfect teeth, free of cavities, in a man 23 years old with a congenital stricture of the esophagus. For the first 16 years of his life his diet had been almost wholly milk, with some cocoa and cream of wheat. Since that time he has been able to swallow thin custards, a little candy, and occasionally a cracker. He had used a tooth brush for the first time 9 months before coming under their observation, and had never before consulted a dentist. Both his father and mother had had very poor teeth, one sister and a brother had good teeth, while another sister had had several cavities. Certainly there had been little opportunity for food impaction in his teeth, and his diet was very low in sweets.

In our studies we have found no significant variations in susceptibility between boys and girls. Neither have we found any correlation between the height and weight status of the children and their susceptibility to this disease.

In conclusion, we wish to emphasize that probably no single principle can be applied equally well to all persons in the prevention of tooth decay. There are some, undoubtedly, who are immune to this disease. It probably makes no difference what such persons eat, unless, perchance, some serious illness or metabolic disturbance causes this immunity to disappear. We are unable to explain the nature of true immunity. It may be due to conditions which determine the inherent ability of Bacillus acidophilus to thrive in the body, and is probably hereditary. There are also some persons who are so susceptible that the disease cannot be checked by adherence to an ordinary type of diet that fulfils all nutritional requirements, even if it contains restricted amounts of sweet food. The majority of those who are *moderately* susceptible to caries would, however, probably be protected in large part by adherence to diets that are low in artificially sweetened food.

There is strong evidence that Bacillus acidophilus, *growing* in protected areas in the mouth, is the primary cause of tooth decay. The kind of food one eats is of importance chiefly as it provides the medium for the growth of these organisms. If the diet provides a pabulum in the mouth and intestinal tract that is favorable to the growth of these organisms, caries will probably result, irrespective of the nutritional balance of the

diet, unless the teeth are so shaped and arranged that all tooth surfaces are readily cleaned and offer no possibilities for food impaction, or unless the person is protected by a natural immunity.

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A STUDY OF THE DIETARY AND GROWTH RATES OF 24 GIRLS, 6 TO 15 YEARS OF AGE, WHILE RECOVERING FROM VARYING DEGREES OF MALNUTRITION[1]

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AN OPPORTUNITY to observe the increases in body weights in a group of girls, previously malnourished, was found while making a dietary study at El Nido Lodge, a health camp for girls. The records of gains in weight during residence at the camp revealed accelerated growth in many individuals and but few cases of growth rates below the expected ones. These increments in weights were stimulated by the hygienic routine, and a diet adequate in kind and slightly in excess of normal needs in quantity.

The camp is favorably located in regard to elevation, exposure to sunlight, and complete isolation. There are ample playgrounds supplied with swings, trapeze, and swimming pool. The building is spacious, airy, and, from all appearances, kept in a strictly sanitary condition. Single beds and separate dressing tables are arranged in the two dormitories for twenty-four girls. During the winter months the camp admits two groups of girls for a stay of four months each. No child with organic health defects is admitted. The complaints upon which they are usually accepted are: anemia, subnormal weight, and a general run-down condition. The children receive a thorough physical examination on entrance and at later dates whenever an examination is indicated. Regular dental care is provided and many of the children have teeth needing considerable attention. Minor ailments are taken care of by a staff of physicians. Whenever a major illness occurs, the patient is sent to a hospital or to her home for treatment. The resident staff of workers includes two nurses, a housekeeper and a house man. The head nurse is the resident administrative officer. She selects the dietary, keeps the health records and, in general, supervises the welfare of the children.

The dietary study was begun on February 21, and for two months thereafter the institution was visited weekly for the purpose of observing the eating habits of the children and the manner of preparing and serving the food. The children received three regular meals a day, the noon meal being the largest one, and cup of milk in the middle of the afternoon. An inventory of all foods was taken on the afternoon of February 28 and

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again on the afternoon of March 31. A careful record of all weights of foods purchased during the month was kept with the help of the head nurse and the housekeeper. A weekly check-up by weighing samples of eggs, fruits and vegetables was made, also. The nutritive value of the diet was calculated by the share method of Rose (1), the results expressed in *edible portion*, figures being those shown in table 1.

It is recognized that a "per person, per day" division of an institutional dietary is not a measure of food consumption for any individual in the group. In this instance, however, the children were always encouraged to eat some of each of the foods served and but few of them excluded any article of diet. With the exception of a few cases, the gains in weight were rapid and considerably above the expected ones, demonstrating the fact that the total food ingested furnished the necessary surplus for growth.

The total minimum energy requirement for the group was estimated as approximately 52,700 calories. This estimate was made from the age

TABLE 1

Total and average daily nutritive value of food for one month, El Nido Lodge

	CALORIES	PROTEIN	CALCIUM	PHOSPHORUS	IRON
		gms	*gms.*	*gms.*	*gms.*
Total dietary	2,077,961	79,034.5	1,341.23	1,617.6	13.096
Average daily food for 28 persons including 4 adults	67,031	2,549.5	40.04	52.16	0.4224
Food supplied per person, per day	2,394	91.0	1.43	1.86	0.0151

distribution of the children on the basis of the computation by Gillett (2) of a minimum requirement of from 1,300 to 2,150 calories per day for girls at ages 6 to 15, and allowing for light exercise on the part of the nurses and the house man, and for moderate work for the housekeeper. All of the children were Jewish, most of them being of medium or short height in relation to age, and rather stocky in build, characteristics which doubtless would lower the maintenance energy needs. The margin shown in the dietary provision of 67,031 calories, although liberal, is about five per cent lower than the maximum requirement when estimated on the basis of age and amount of exercise. It includes a very small amount of waste, for the meals were served in such a manner as to reduce to a minimum any waste of food by its being left on the plates; and kitchen waste of edible food was negligible. The figures shown in the table indicate that the total food supply for the group was well above the minimum and, in mineral values, approached the optimum of ac-

cepted standards. The average daily calorie value "per person" falls within the range of Gillett's requirements, but although well above the minimum, it is below the highest mean intake on carefully weighed diets reported by Wait and Roberts (3). The daily allowance of protein

TABLE 2

Height-weight gains from Jan. 25 to May 10 of girls from 6.5 to 15 years of age

SUBJECT		AVERAGE HEIGHT FOR AGE*	HEIGHT ON JAN. 25	INCREASE IN HEIGHT BY MAY 10	AVERAGE WEIGHT FOR HEIGHT*	WEIGHT ON JAN. 25	WEIGHT ON MAY 10	INCREASE IN WEIGHT	EXPECTED ANNUAL GAIN IN WEIGHT*
Years of age	Name								
		inches	*inches*	*inches*	*pounds*	*pounds*	*pounds*	*pounds*	*pounds*
15	(D. R.)	63m	62.75	0.0	114	104.75	116.25	11.5	4
13	(A. K.)	60m	59.5	0.5	96	99	111.5	12.5	10
13	N. S.	60m	60.5	0.5	99	84.75	96.5	11.75	10
12	(R. S.)	55s	52.5	0.5	68	54.5	66.25	11.75	10
12.5	(B. W.)	58m	58.75	0.0	87	78.25	83.5	5.25	13
12	(C. S.)	54s	52.5	1.0	68	65	75.75	10.75	10
12	(S. R.)	58m	57.75	0.75	84	78	94.5	16.5	13
11	A. A.	59t	58.5	1.0	88	68	77.75	9.75	13
11	G. S.	52m	53.75	0.75	70	65.25	82.5	17.25	11
11	(J. K.)	58m 62t	59.5	1.0	92	84	103.75	19.75	9 to 13
11	(A. P.)	52s 56m	53.5	0.5	69	60	65.75	5.75	6 to 8
10	(G. D.)	56m	55	0.75	78	62.75	82.75	20.0	10
9.5	(J. T.)	50s	51.25	1.0	62.5	60.5	69.25	8.75	6
9.5	(E. L.)	53m	53.5	0.75	68	62.5	75.5	13.0	8
9	(H. A.)	50s	43.12	0.75	45	50	55	5.0	6
9	(G. A.)	49s	49	0.25	55	52	59.75	7.75	5
9	(L. H.)	52m	52.75	3.0	66	63.25	83.5	20.25	7
9	(E. R.)	55t	57.5	0.0	82	68.5	71.75	3.25	9
9	B. P.	52m	52	1.5	64	55.5	67	11.5	7
9	L. A.	49s	49	0.25	55	53.25	58.75	5.5	5
9	R. H.	52m	51	2.0	61	56.25	76.5	20.25	7
8.5	(F. F.)	51m	51.5	0.25	62	53.75	55.25	1.5	6
7	(F. P.)	50t	50	0.25	56	53.25	59.5	6.25	8
6.5	R. F.	47t	46.5	1.0	49	49	55.25	6.25	6

* Figures from Baldwin-Wood Weight-Height Tables, published by the American Child Health Association; quoted from Rose, *Laboratory Handbook for Dietetics*, 3d. ed. (The lettere "s, m, t," indicate measures as short, medium, and tall for age.)

averaged approximately six per cent less than the maximum actual consumption found in diets freely selected by well-nourished girls, 10 to 16 years of age, by Wait and Roberts (4); the quantitative provisions of calcium, phosphorus and iron were in each case appreciably higher than the intakes of these substances found by the same investigators (5).

It is not assumed that the children ate exactly their own relative portions of the food served, but from the condition of most of them at the end of the 15 weeks, it must be conceded that they had eaten sufficient food for excellent growth. The height and weight gains, many of which exceeded the expected annual increases, are shown for the period of 105 days—January 25 to May 10—and compared with figures representing a probable average for each subject in table 2, the individuals being listed according to age with measures indicated as tall, medium or short in height. That the gains in weight were not merely a matter of a return to the average from a lowered state of nutrition, may be seen by comparison of the gain in pounds for the period of 15 weeks with the expected annual gain for each subject. In three cases in the 12 to 15 year old group, this was true, these children showing weights below the average at the end of the period in spite of gains in excess of the annual increase expected. For the other four in this group and for thirteen of the remaining seventeen, the increases in weight placed the individual above the average by from 3 to 17.5 pounds, or from 4.6 to 27 per cent. Some of the most accelerated growth curves are shown in chart I. These are for children 9 and 11 years of age. More moderate gains for 12-year olds and rapid increases toward expected weight levels for several others are shown on chart II.

During the period of study it was decided to add "Calavos"[2] to the diet of the children under observation for the purpose of testing the influence on the rates of growth and the hemoglobin content of the blood. At first all of the children were offered the avocados added to salad or on a cracker with the noon or afternoon meal. A control group of seven members was formed of those who refused the first serving and it happened to include as representative a group from the standpoints of age distribution and rate of growth as did the experimental one of seventeen members. For 60 days without interruption, the experimental group consumed an average of approximately 1.3 ounces (36.9 grams), of avocado per child per day. The subjects receiving the avocado are marked by the bracketing of their initials in the height-weight table. Hemoglobin tests did not reveal any improvements that could with certainty be regarded as due to the supplementary feedings. The only point that should be mentioned in regard to the supplementary food is the fact that the addition of avocado fat in quantities of approximately

[2] The avocados were furnished by The Calavo Growers of California, a coöperative marketing association which uses the trade name "Calavo" for fruits of the avocado reaching the standard of nutritive value set by the association.

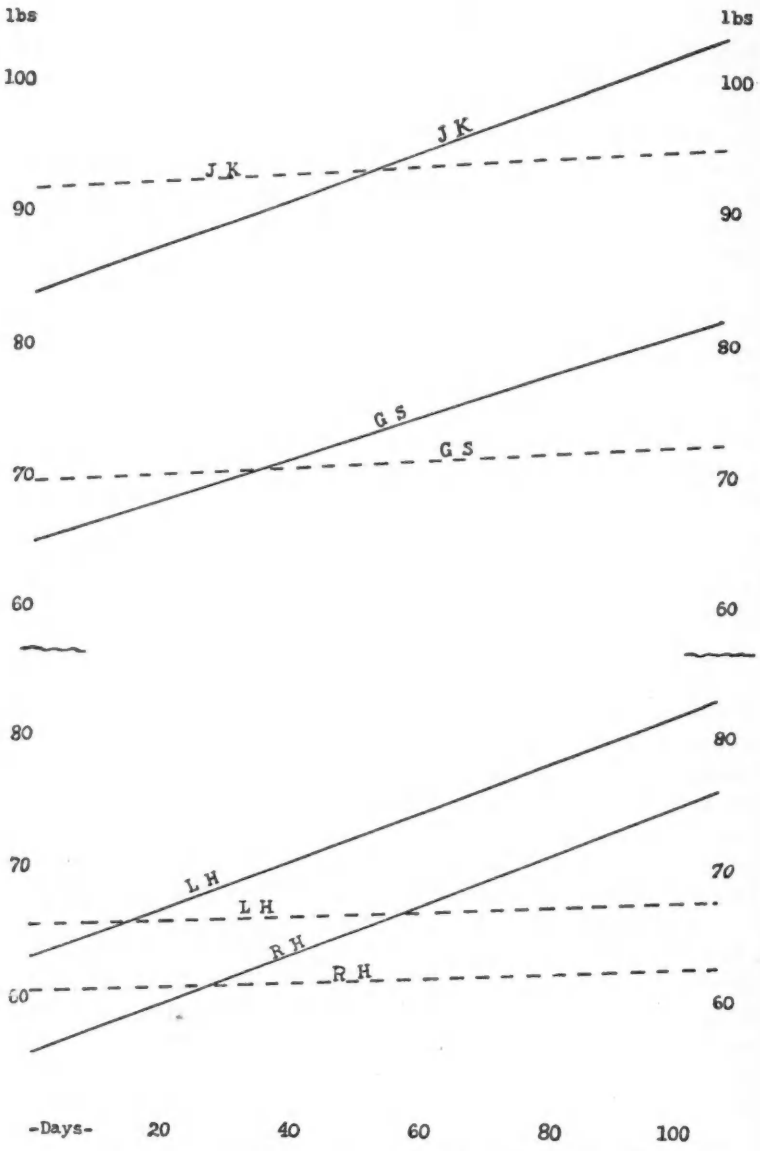

CHART I. INCREASES IN WEIGHT FOR GIRLS 9 AND 11 YEARS OF AGE
Actual growth ———— Expected growth - - - - -

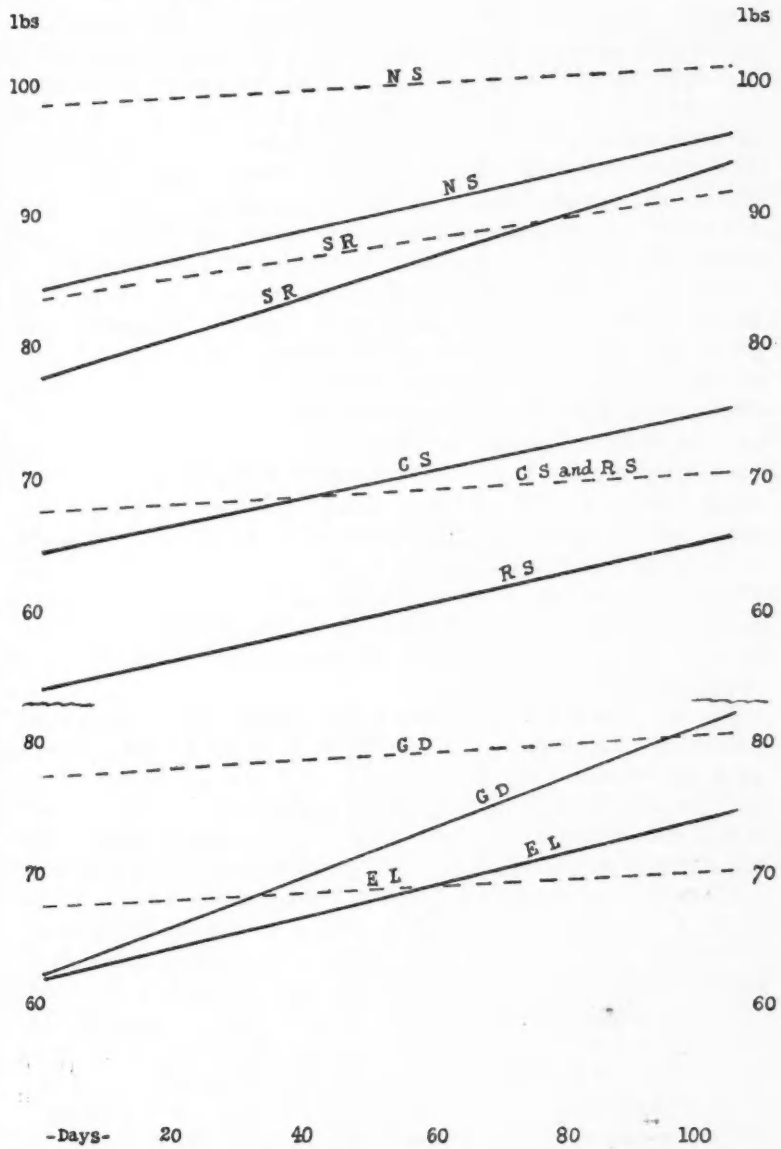

CHART II. INCREASES IN WEIGHT FOR GIRLS 10, 12, AND 13 YEARS OF AGE
Actual growth ———— Expected growth - - - - -

7.5 grams daily was tolerated for the 60-day period by the entire experimental group, even though the general dietary contained a liberal supply of other fats. The maximum and the mean gains in weight were the same for the control group as for the group taking the avocado. The minimum gain for the controls was higher than the minimum shown in the experimental group. Individual differences in weight gains would doubtless be accounted for by variations in appetite, as shown by Wait and Roberts (6), or by the nutritive condition, since marked malnutrition was apparent in many of the subjects at the beginning of the study.

The growth period observed, although shorter than some, is comparable in length to many other studies reported. The average gain in weight per week was 0.72 pounds. Morgan and Barry (7) reported an average of 0.35 pounds per week increase induced by the use of wheat germ; Chaney (8) had previously shown an increase of 0.38 pounds per week for eight weeks as a result of the addition of oranges to the diet; Morgan, Hatfield and Tanner (9) reported 0.24 pounds by use of extra milk; and others, cited by Morgan and Barry (7), reported increases as low as 0.12 pounds and 0.09 pounds as gains worthy of record. In a 4-week study of 10 non-gaining preventorium children, 8 to 13 years of age, Hord and Roberts (10) found that a higher calorie intake through the use of concentrated foods, and more hours of sleep and increased relaxation, resulted in an average gain of 2.5 pounds per month, or approximately 0.625 pounds per week.

The study herein reported shows, for a longer period, accelerated growth similar in degree to that reported by Hord and Roberts. As it is altogether probable that the girls from 11 to 15 years of age had entered the adolescent stage of rapid growth, it is of interest to compare their weight and height increases with those of the younger children. The eleven girls in the older age group averaged an increase of 0.79 pounds per week; the thirteen younger girls made an average gain of 0.66 pounds per week. In each group an unusual capacity for growth was demonstrated by a fairly large number. In fact sixteen of the entire number gained more in weight in fifteen weeks than the expected gain in a year. The average gain per week for these 16 subjects was 0.91 pounds. The individual variation in rate of growth shows a wide range. In the group 11 to 15 years of age, the maximum gain was 19.75 pounds in the fifteen weeks, the minimum was 5.25 pounds and the mean was 11.75 pounds. The group 6.5 to 10 years of age gained a maximum of 20.25 pounds, a minimum of 1.5 pounds and a mean of 7.75 pounds.

Growth in height is far less noticeable. In the older group, D. R.,

who was 15 years of age, had probably reached adult stature. If she is omitted, the average height gain for the other ten would be 0.043 inches per week. The average gain for the thirteen younger girls was 0.06 inches per week.

The dietary furnished an excellent variety. Fruit was served at practically every meal—raw or stewed for breakfast, and as salads or for dessert, raw, or in whips, or with gelatin or tapioca at other meals. Vegetables were used in abundance and in large variety, including fresh asparagus, beets, cabbage, carrots, cauliflower, celery, lettuce, onions, peas, potatoes (white and sweet), radishes, squash, spinach, canned corn, peas, string beans and tomatoes, and dried lima and navy beans, lentils and split peas. Milk, meats and fish supplied a large proportion of the protein, but eggs, cheese, peanut butter, and the cereals and legumes helped to make up the total. Two-thirds of the crackers and five-sixths of the bread were of whole wheat. The weights of the food materials used during the month, in *as purchased* figures, were as follows:

	Pounds		*Pounds*
Bread and crackers	214.0	Dill pickles, catsup	6.5
Cakes and cookies	21.0	Dried fruits	40.75
Cereals, macaroni, flour	88.0	Dried legumes	24.0
Canned goods		Eggs	60.0
Fish	13.25	Fats, including peanut butter	13.0
Fruits	71.5	Fresh fruits	235.0
Vegetables	63.0	Fresh vegetables	237.0
Dairy products		Jello	5.0
Butter	58.75	Sugar and jams	72.0
Cheese	34.25		
Milk	1638.0		

It would seem that the diet was adequate in every respect. A check on the vitamin content, as complete as possible from our limited knowledge of their quantitative presence, indicated that vitamins A, B, and C were bountifully supplied and that the other vitamins were probably furnished in sufficient amounts.

No doubt the liberal use of milk, fruits and vegetables, together with long hours of sleep at night, daily afternoon rest in bed, and the restraint of but half-day sessions in school to which they were not permitted to walk but were taken in a bus, practices rigidly enforced at this camp, would provide the best conditions for rapid growth for children in a normal state of nutrition. However, after periods of retarded development, animals have been found to grow at greatly accelerated rates. This effect of re-alimentation after a period of suppressed growth was reported by Osborne and Mendel (11) and by Stewart (12) for the rat,

by Thompson and Mendel (13) for the mouse, and by other investigators for other animals. It has been observed in the child by Schloss (14), by Boas (15), and by Hess (16). It is evident that many of the subjects of this study must have undergone a previous depression of the nutritive processes of such a nature as to preserve the capacity for growth and to induce its resumption at an accelerated rate on the surplus food supply. Furthermore, such growth capacity indicates that in many of the so-called supplementary feeding experiments there must have been dietary deficiencies uncorrected or the gains would have been greater or more rapid than those reported.

SUMMARY

1. Malnourished girls, 6 to 15 years of age, were found to grow at accelerated rates for a period of 15 weeks on a dietary furnishing a daily allowance per person of 2394 calories, 91 grams of protein, 1.45 grams of calcium, 1.86 grams of phosphorus, 15 milligrams of iron, and liberal vitamins, and under the régime of a well-regulated health program.

2. In many instances, gains in body weights were in excess of the expected annual gains. Gains in height were not above the expected ones.

3. Supplementary feeding for 60 days with avocado did not show any further stimulation of growth in the group receiving it over the control group.

ACKNOWLEDGMENT

The authors wish to express, to the Medical and Governing Boards of El Nido Lodge, their appreciation of the permission to make this study, and, particularly, to thank Miss Whiteman, nurse in charge, and her assistants for their hearty coöperation in carrying it out.

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A STUDY OF THE NUTRITIONAL ADEQUACY OF THE PERSONNEL DIETARY OF A HOSPITAL[1]

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IN ORDER to ascertain whether the complaint of "too starchy meals" was justifiable, a week's study of the personnel dietary of Harborview Hospital was undertaken. The hospital personnel, numbering approximately 300, is served from a cafeteria. Hot foods and beverages are served to each individual as he passes along the counter, while desserts, salads, dressings, pickles and condiments, cold beverages, and cream are placed on the counter. Bread, butter, and sugar are available at each table in the dining rooms. A set menu, in use when this study was made, offered a choice only in the matter of beverages and breakfast cereals. The maids on duty in the cafeteria are cautioned against serving too generously, but the privilege of taking more than one helping is used freely, especially with desserts, beverages, and cream.

The group served consists entirely of adults, mostly below middle age. About three times as many women as men are served.

Four meals, breakfast, lunch, dinner, and night supper, are served. Mid-morning cocoa is provided at 10:00 a.m., and supplies for the preparation of a lunch between midnight and morning are furnished the night nurses. The menus for the week studied show the type of meal served.

METHOD

The number of men and of women was counted at each meal, and the total number of each, for the day, divided by three, since very few ate more than three meals daily due to the arrangement of working hours. All foods were weighed before being sent from the kitchen. The ingredients of recipes were weighed separately, then the completed product. The sum of the plate waste and left-over food was deducted from the original weight to determine the amount actually consumed.

The calculations were made in accordance with the abridged method in Rose's *Laboratory Handbook for Dietetics*, pp. 49–53. In this scheme, all foods are divided into six classes which in turn are sub-divided into groups. A "type food" is selected for each class, and the weights of the other foods in the class are adjusted to conform with the type food as to total calories, protein calories, and fat calories. The total weights

[1] Received for publication September 1, 1933.

MENU FOR THE WEEK STUDIED

DAY	BREAKFAST	LUNCH	DINNER	NIGHT SUPPER	3:00 A.M.
Sun.	Grapefruit Farina Prepared cereals Hot cakes-syrup Toast Coffee, tea or milk	Consommé Steaks French fried potatoes Cauliflower Ice cream Coffee, tea, milk or buttermilk	Toasted rarebit sandwiches Fruit salad Spice cake Coffee, tea, or milk	Same as noon	Bread Butter Honey Coffee Cream Cocoa paste Milk
Mon.	Kadota figs Ralston Prepared cereals Soft cooked eggs Toast Beverages	Canadian pea soup Vegetable plate: Carrots and string beans au gratin; baked potato Graham nut muffins-preserves Pears Beverages	Roast veal Mashed potatoes Gravy Buttered peas Radishes Baked rice pudding Beverages	Scrambled eggs Tomato asparagus salad Graham nut muffins-preserves Pears Beverages	Bread Butter Pickles Coffee Cream Milk
Tues.	Oranges Wheat flakes Prepared cereals Poached eggs Toast Beverages	Beef à la mode Buttered noodles Shredded lettuce and radishes with French dressing Cocoanut custard pie Beverages	Baked ham Potatoes au gratin Mashed squash Watermelon preserve Sponge cake with peaches and whipped cream Beverages	Cream of corn soup Crackers Roast beef sandwich Lettuce salad French dressing Cocoanut custard pie Beverages	Bread Butter Preserves Coffee Cream Milk
Wed.	Rhubarb Farina Prepared cereals Scrambled eggs Toast Beverages	Tomato broth Crab meat and shrimp in ramekins Cabbage-green pepper salad Applesauce and whipped cream Beverages	Cream of tomato soup* Roast lamb or baked halibut** Franconia potatoes Cauliflower Tutti-frutti ice cream Sponge cake Beverages	Tomato soup Cheese sauce on toast Fruit salad Beverages	Bread Butter Meat and pickle spread Cream Milk Coffee
Thurs.	Grapefruit Cracked wheat Prepared cereals Bacon Muffins-marmalade Toast Beverages	Vegetable soup Casserole of lima beans and ham Tomato salad-choice of dressings Pears-peanut butter cookies Beverages	Lamb chops, Creamed potatoes Spanish corn Lettuce salad Apricot whip Beverages	Vegetable soup Creamed ham on toast Tomato salad Pears Cookies Beverages	Bread Butter Cream Preserves Coffee Milk
Fri.	Oranges Oatmeal Prepared cereals Fried eggs Toast Beverages	Iced tomato juice Omelet Peppers stuffed with rice Layer cake Beverages	Fried salmon-tartar sauce Mashed potatoes Peas Rhubarb cobbler with whipped cream Beverages	Same as noon except for dessert Ice cream with pineapple sauce	Bread Butter Coffee Cream Cocoa paste Milk Cheese
Sat.	Bananas Ralston Prepared cereals Soft cooked eggs Toast Beverages	Link sausage Scalloped potatoes Celery and apple salad Caramel blanc mange with whipped cream Beverages	Beef pot roast Franconia potatoes German carrots Gravy Fruit cup Beverages	Cold meat Scalloped potatoes Celery salad Caramel blanc mange with whipped cream Beverages	Bread, butter Coffee, cream Milk Cocoa paste Meat and pickle spread

* Monthly staff dinner Wednesday night, attended by all staff doctors.
** Study was conducted during Lent which necessitated serving fish on Wednesday.

TABLE 1

Type class factors for calculating fuel values from adjusted weights

Calories per kilogram

CLASS	GROUP	FOR TOTAL CALORIES	FOR PROTEIN CALORIES	FOR FAT CALORIES
I	Foods from cereal grains	3,560	462	88
II	Milk	693	134	352
IIIa	Dried legumes	3,476	880	154
IIIb	Vegetables and fruits	660	66	
IV	Fats and oils	7,690	40	7,650
V	Sugars, syrups, etc.	3,690		
VI	Eggs, cheese, meats, and other flesh foods	1,340	660	770

TABLE 2

Summary of the calculations for one day

Day: Thursday. Census: Men 217/3; Women 577/3

I. Distribution of caloric intake

CLASS	TOTAL CALORIES	PROTEIN CALORIES	FAT CALORIES	CARBOHYDRATE CALORIES	PER CENT
I	129,726	17,117	6,947	105,662	20.1
II	126,908	17,989	79,824	29,077	19.7
IIIa	33,057	8,436	2,637	22,984	5.1
IIIb	68,765	6,363		62,402	10.6
IV	150,665		149,882		23.4
V	83,798			83,798	13.0
VI	52,164	16,612	33,018	1,983	8.1
Total.....	645,083	66,517	272,308	305,906	100.0

II. Energy requirement

A. Standard		
Men	217/3 × 2800	202,533
Women	577/3 × 2400	461,600
		664,133
B. Actual intake		645,083
C. Per cent of standard		97.2%

III. Protein requirement

A. Standard		
Men	217/3 × 70 (gms.)	5,063
Women	577/3 × 56 (gms.)	10,771
		15,834
B. Actual intake	66,517/4	16,629
C. Per cent of standard		105%

for each class are multiplied by a "type class factor." To determine carbohydrate calories, the sum of the protein and fat calories is deducted from the total calories.

As all weights and measures in this study were expressed in the metric system, it was necessary to convert the type class factors from "calories per pound" to "calories per kilogram" (*see* table 1). Table 2 summarizes the calculations for one day, while the daily totals are compiled in table 3.

TABLE 3

Calculated value of food consumed during one week

DAY	TOTAL MEALS	TOTAL CALORIES	PROTEIN CALORIES	FAT CALORIES	CARBOHYDRATE CALORIES
Sunday	525	478,888	46,599	197,513	235,535
Monday	874	739,122	71,952	330,715	335,879
Tuesday	855	759,826	73,115	369,454	310,600
Wednesday	918	709,054	64,842	279,833	363,381
Thursday	794	645,083	66,517	272,308	305,906
Friday	859	660,886	58,635	284,864	316,716
Saturday	832	642,330	69,504	315,449	256,524

TABLE 4

Actual consumption as compared with arbitrary standard

	CENSUS			STANDARD		CONSUMPTION					
						Calories			Protein		
	Men	Women	Total	Total calories	Protein grams	Total	Per cent of standard	Calories per capita	Total grams	Per cent of standard	Grams per capita
Sunday	49	126	175	439,733	10,487	478,888	109	2740	11,650	111	66.0
Monday	79	212	291	730,667	17,416	739,122	101	2540	17,988	103	61.8
Tuesday	81	203	284	716,400	17,094	759,826	106	2670	18,279	107	60.3
Wednesday	94	212	306	771,467	18,456	709,054	92	2320	16,211	88	52.5
Thursday	72	193	265	664,133	15,834	645,083	97	2440	16,629	105	62.6
Friday	78	208	286	718,667	17,136	660,886	92	2400	14,659	85	51.4
Saturday	82	195	277	698,267	16,674	642,330	92	2520	17,376	104	62.5
Total	535	1349	1884	4,739,334	113,097	4,635,189	98	2460	112,791	99	59.8

Average per capita is computed numerically without regard to sex.

Owing to the difficulty of ascertaining the actual requirement of the group, since there was wide variation in size, age and occupation, an arbitrary set of standards was adopted based on the requirements of the average man of 70 kilograms and the average woman of 56 kilograms. The Sherman standard of 1 gram of protein per kilogram of body weight was used, and the energy requirement estimated at 2,800 calories per man and 2,400 calories per woman. The actual consumption as compared with the standard is shown in table 4.

Table 5 shows the percentage distribution of calories as suggested by Rose for various income levels. Table 6 shows, for comparison with this standard, the actual distribution of total calories in the Harborview dietary during the week studied.

TABLE 5

*Working plan for construction of an adequate diet for a healthy adult**

LEVEL OF INCOME	PER CENT OF TOTAL CALORIES FROM EACH CLASS OF FOOD					
	Food from cereal grains I	Milk II	Vegetables and fruits IIIa and IIIb	Fats IV	Sugar V	Eggs, cheese, meats, and other flesh foods VI
Low	40	18	12	12	10	8
Moderate	30	13	15	17	10	15
High	20	16	20	18	10	16

* Rose: *Laboratory Handbook for Dietetics*, p. 31.

TABLE 6

Distribution of calories in dietary studied

DAY	I FOOD FROM CEREAL GRAIN	II MILK	IIIa AND IIIb VEGETABLES AND FRUITS	IV FATS	V SUGAR	VI EGGS, CHEESE, FLESH FOODS
Sunday	17.7	20.4	11.1	21.4	20.5	8.8
Monday	17.9	20.0	15.8	24.9	13.2	8.2
Tuesday	18.6	18.3	6.8	26.4	16.7	13.3
Wednesday	15.7	21.1	8.4	27.1	17.8	9.9
Thursday	20.1	19.7	15.7	23.4	13.0	8.1
Friday	17.3	19.7	8.5	25.4	21.2	7.9
Saturday	14.9	21.6	15.0	24.8	9.4	14.3
Weighted average	17.5	20.0	11.5	24.9	16.0	10.2

DISCUSSION

It will be seen that the actual consumption coincided very nearly with the arbitrary standard for total calories and protein grams. In comparing the percentage distribution of calories with the plan suggested by Rose, this group was considered to be one on a moderate income level. The following points of interest were noted:

1. The consumption of cereal foods was decidedly low, even below the standard for the high income group.

2. The milk consumption was very high. This may be due to several causes. It has been noted that milk is used freely in the average home

in this locality, and the habit of drinking milk carries over to the institution. This hospital uses large quantities of milk in cooking, and makes its own ice cream. Eighteen per cent cream, used unrestricted in beverages and on desserts and cereals, is included in this food group.

3. The calories from fruits and vegetables were low, probably partly due to the tastes of the group, and to the season, March, when variety is limited. On scanning the menus, one will note that some vegetable or fruit was present in every meal. The vegetables appear to be about equally divided between the five and ten per cent groups. Potatoes were used only once daily, with the exception of two days.

4. The fat intake appears high. This is due to the liberal use of whipping cream, and an unlimited allowance of butter. It is quite possible that the consumption of foods of this class was not so great as was indicated, due to the difficulty of separating both butter and whipping cream from other foods in the plate waste.

5. It was impossible to determine how much sugar was present in the beverages and cereals that were included in the waste, so that the actual consumption of sugar was probably a little lower than is indicated. However, it is apparent that the young American, given a choice, will consume more sugar than is considered standard.

6. The use of meat, eggs and cheese, while above the standard given for a low-cost dietary, was below that for a dietary of moderate cost. Since the high milk consumption served to provide adequate protein, and since the group was preponderantly feminine, this limited meat, egg and cheese intake was not necessarily a disadvantage. The large consumption of fats and sugars, a matter of choice, naturally forced the other percentages down.

CONCLUSION

This study showed that whatever justification might be attached to the criticism of "too high starch content" was a matter of individual choice, since the average consumption of cereal foods and potatoes, the products generally thought of in this connection, was below standard. With the exception of a low proportion of vegetables and fruits, which can be explained on the basis of personal choice, the dietary was entirely satisfactory as compared with accepted standards. It might be remarked that from casual observation one would conclude that the group as a whole was well-nourished, as indicated by a general tendency to gain weight.

THE USE OF EVAPORATED MILK IN DIGESTIVE DISORDERS, PARTICULARLY PEPTIC ULCER[1]

PERCY B. DAVIDSON, M.D., FERNANDO BIGURIA, M.D., AND RUTH GUILD, A.B.

THE following is a comparative study of the stimulating power upon the gastric secretion and the action on the emptying time of the stomach of (1) ordinary milk, (2) evaporated milk diluted, (3) evaporated milk undiluted, and (4) a mixture of milk and 20 per cent cream. The composition of these different meals is approximately as follows:

	PROTEIN	FAT	CARBOHYDRATE
	grams per cent	*grams per cent*	*grams per cent*
Ordinary milk	3.5	3.75	4.5
Evaporated milk and water (equal parts)	3.5	4.0	5.0
Milk and 20 per cent cream (equal parts)	2.9	11.1	4.5
Undiluted evaporated milk	7.0	7.85	10.0

Pressure and temperature involved in the preparation of evaporated milk cause certain changes in the milk constituents. During the process of homogenization the evaporated milk is forced under a pressure of 2000 to 3000 pounds through very small apertures, which results in the breaking up of the fat globules into much smaller ones. The higher temperatures to which the evaporated milk is subjected during sterilization affects some heat-labile constituent of the whey so that tryptic digestion *in vitro* takes place more readily (1).

Since Pavlov's (2) experiments on the isolated pouch of the dog's stomach, milk has been known to have a relatively low stimulating power upon the gastric secretion, while cream and fats in general inhibit this secretion. Sippy found that milk and cream mixtures, combined with alkalies, made it possible to keep the stomach practically free from uncombined HCl. For the treatment of certain gastro-intestinal disorders, milk and cream are of value because they are rich in important elements required by the body, inhibit gastric secretion, and possess a high acid-combining power.

[1] From the Department of Physiology of the Tufts College Medical School and the Gastro-Intestinal Clinic of the Boston City Hospital. Received for publication July 1, 1933.

A

Our studies on secretion were carried out upon ulcer patients (four duodenal and two gastric) and upon a Pavlov pouch dog.

METHOD

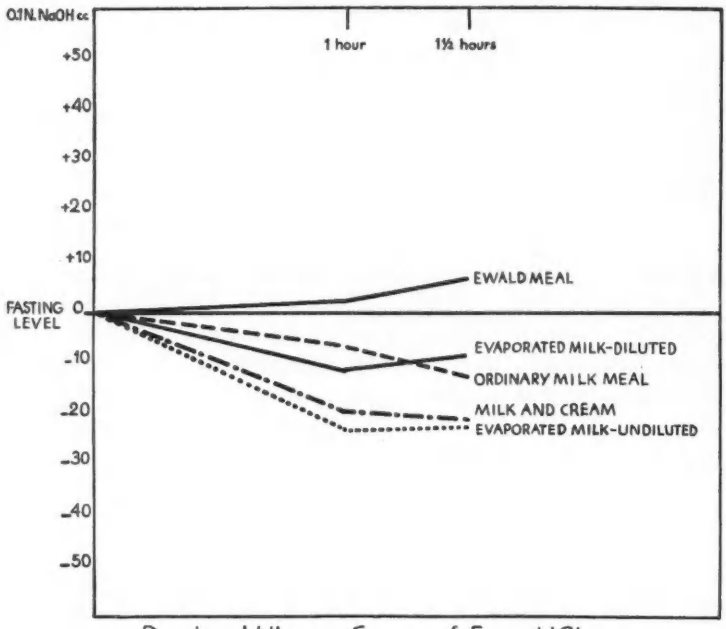
The patients were requested not to take any food after 9 p.m. the day preceding the test. At nine the following morning a Levin tube was inserted through the nose into the stomach, and the fasting secretion withdrawn and studied for free and combined HCl. The Ewald meal (2 glasses of water and 4 arrowroot biscuits) or 240 cc. of one of the other meals were given, and 10 cc. of the gastric contents withdrawn at intervals of one, and one and one-half hours. In order to obtain as much homogenization as possible, the precaution was taken of mixing the contents of the stomach before each aspiration. The free and combined acidities were determined for each specimen, using Töpfer's indicator for the former and an alcoholic solution of phenolphthalein for the latter. Neutralization was carried out with 1/10 normal sodium hydroxide solution.

For the animal studies a pouch was isolated from the rest of the stomach in a female dog, according to Pavlov's technique. No experiments were performed on this animal until two months after the operation, when healing was complete. On experimental days the dog was kept away from food for 15 hours, and the gastric juice collected for a period of one hour after the administration of one of the following meals: 240 cc. of ordinary milk; evaporated milk diluted; evaporated milk undiluted; and milk and cream combined. Titration of the acidity was done with 2 cc. of the secretion and 1/100 normal sodium hydroxide solution, using the indicators above mentioned. The final figures are expressed in 1/10 normal sodium hydroxide solution necessary to neutralize 100 cc. of gastric contents.

RESULTS

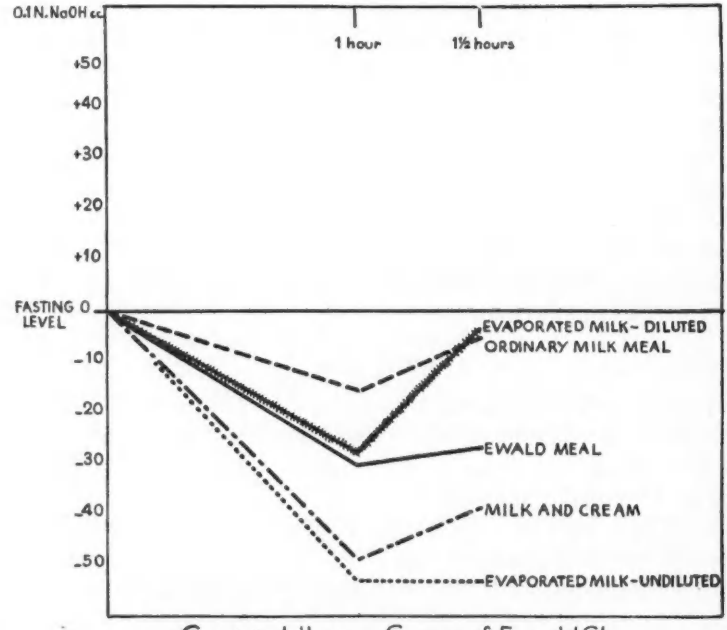
In charts 1 and 2 the curves of secretion of free HCl in two peptic ulcer patients are shown. The acidity of the fasting contents was taken as the basal level, and the free acid values upon stimulation added or subtracted according to the individual case.

The Ewald meal gave the highest values, except in two instances in which it was less stimulating than either diluted evaporated, or ordinary milk. The ordinary milk meal was slightly more stimulating than diluted



Duodenal Ulcer— Curves of Free HCl

CHART 1



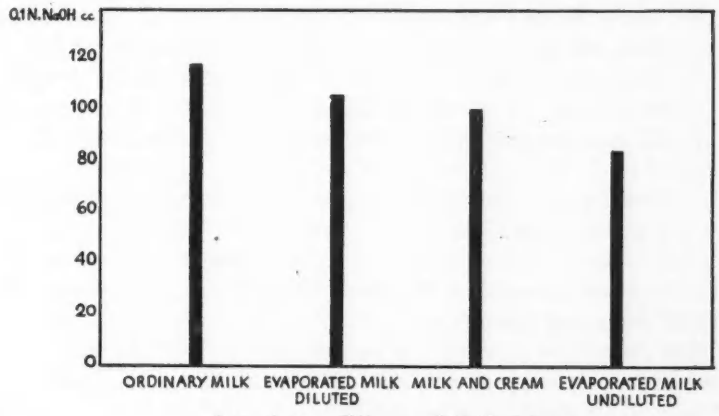
Gastric Ulcer— Curves of Free HCl

CHART 2

evaporated milk in three patients. In the rest of the cases it behaved practically the same.

Undiluted evaporated milk gave lower values than the milk and cream mixture in four instances, the same value in one, and a higher value in another. The combined acid values were lower for the Ewald meal than for any of the others used.

In the studies of the Pavlov (2) pouch dog, six tests were made with each of the meals and the averages obtained are given on chart 3.



Stimulative Effects of Milk Meals on Gastric Acidity in a Pavlov Pouch Dog

CHART 3

Ordinary milk appears to stimulate the secretion of HCl more than either dilute evaporated milk, or milk and cream, and much more than undiluted evaporated milk.

The amount of juice secreted was less with undiluted evaporated milk and milk and cream (about 5 cc.), than with milk and diluted evaporated milk (about 8 cc.).

B

The motility studies in relation to the different types of meal were done on normal humans, on peptic ulcer patients with and without obstruction, and on normal dogs.

METHOD

Under fasting conditions, 480 cc. of each of the different milks mixed with 4 oz. of barium sulphate were given to the patients, and plates and

fluoroscopic observations made every hour during the first three hours, and every half-hour thereafter.

Dogs were given 120 cc. of each of the meals and 2 oz. of barium. The animals were trained, and observations taken only when a certain uniformity in the results indicated that the psychic factors had been eliminated.

RESULTS

In one normal subject, undiluted evaporated milk left the stomach in 7 hours, while the milk and cream mixture took 6 hours. Evaporated milk, diluted, and ordinary milk both emptied in 5 hours.

In a second normal subject, undiluted evaporated milk and the milk and cream mixture left the stomach in 5 hours. With diluted evaporated milk and ordinary milk, the stomach was empty at the end of 4½ hours.

In a third normal subject, with ordinary milk and diluted evaporated milk, the stomach emptied in 5 hours.

In two ulcer patients without obstruction, diluted evaporated milk and ordinary milk emptied in 5 hours, while undiluted evaporated milk and milk and cream took 6 hours.

In the case of two patients with partially obstructive duodenal ulcers, the emptying time was equally delayed with all the meals given.

The results in the dog were as follows:

Evaporated milk, diluted	emptied in 3 hours
Ordinary milk	emptied in 4 hours
Evaporated milk, undiluted	emptied in 5 hours
Milk and cream	emptied in 4 hours

On fluoroscopic check:

Evaporated milk, diluted	emptied in 3 hours and 15 minutes
Ordinary milk	emptied in 4 hours
Evaporated milk, undiluted	emptied in 4 hours and 30 minutes
Milk and cream	emptied in 4 hours

C

In the case of meals containing more fat, such as undiluted evaporated milk and a milk and cream mixture, the delayed emptying time of the stomach and the lowered acidity of the contents suggested the possibility of duodenal regurgitation as a factor that could explain the situation. Since Boldyreff's studies demonstrating the presence of pancreatic enzymes in the gastric contents, much work has been done in the field,

and a number of investigators think that neutralization of acidity is greatly influenced by duodenal regurgitation. Rehfuss and his co-workers (3), Bolton and Goodhart (4), Apperly and his associates (5), and Olch (11) concluded that regurgitation is an important factor in this connection. We made determinations of trypsin as indicative of the degree of duodenal regurgitation in the gastric contents in a series of 15 ulcer patients, some of them obstructive, using a modification of the method worked out by McClure, Wetmore, and Reynolds (6).

METHOD

Two hundred cc. of olive oil were administered under conditions the same as those in our studies on acidity. The contents of the stomach were withdrawn immediately before, and one hour after the meal. Free and combined acidities were determined on both specimens. One cc. of the secretion was put into each of 2 tubes containing 9 cc. of 1 per cent casein in a 0.5 molar phosphate buffer solution having a pH of 8.4, and 0.02 cc. toluol. To one of the tubes, 5 cc. of 25 per cent metaphosphoric acid were added, the resulting protein precipitate filtered off, and 2 cc. of the filtrate digested with Folin's digestive mixture; this was the control. The other tube was treated similarly after 24 hours' incubation at 40°C. Both tubes were Nesslerized and compared with a standard ammonium sulphate solution containing 0.15 mg. of nitrogen. The difference in the non-protein nitrogen values of the 2 tubes represents, after suitable corrections for volumes used, the proteolytic action of 1 cc. of gastric contents under constant hydrogen ion concentration, and at the optimum for tryptic digestion.

RESULTS

The figures obtained showed no relation whatever between the acid concentration and the amount of trypsin present in the gastric contents, high acid values being found with either low or high tryptic values.

Our results corroborate the conclusions of Baird, Campbell and Hern (7), MacLean and Griffiths (8, 9), MacLean (13), and McCann (10) that duodenal regurgitation is not an important factor in the regulation of gastric acidity.

D

CONCLUSIONS

1. In peptic ulcer patients the Ewald meal gives higher free acid values than any of the other meals used. Diluted evaporated milk and ordi-

nary milk tend to lower the free HCl of the fasting stomach, ordinary milk being slightly less effective in our series of cases. The same results were obtained in the Pavlov pouch dog. Undiluted evaporated milk and the milk and cream mixture lower the free HCl of the fasting stomach to about the same degree. In the Pavlov pouch dog undiluted evaporated milk gives lower acid values than the milk and cream mixture. Both are less stimulating than either diluted evaporated milk or ordinary milk.

2. In normal humans as well as in non-obstructive peptic ulcer patients, the emptying time of the stomach is the same for ordinary milk and for diluted evaporated milk. In partially obstructed cases the emptying time is equally delayed. In the normal dog diluted evaporated milk empties faster than ordinary milk. In normal humans the emptying time of the stomach is about the same with undiluted evaporated milk or a milk and cream mixture. The same can be said for patients with obstructive and non-obstructive ulcers. In the normal dog the emptying time seems to be slightly longer for undiluted evaporated milk.

3. The regurgitation of duodenal contents into the stomach does not seem to be the main factor in the regulation of acidity.

4. With regard to the influence on gastric acidity and motility, the above experiments seem to indicate that evaporated milk diluted and undiluted may be used as well as milk, and milk and cream mixtures, in the treatment of conditions that require a bland or semi-bland diet.

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THE VALUE OF SOME COMMON VEGETABLES IN CURING NUTRITIONAL ANEMIA IN THE RAT[1]

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THE fact that copper as a supplement to iron affords a marked stimulation to hemoglobin regeneration in rats suffering from nutritional anemia is widely accepted. Also, in the cure of some cases of anemia in infants, iron and copper have been more effective than iron alone, as reported by Josephs (1), Lewis (2), and Caldwell and Dennet (3). Since strained vegetables are widely used in infant diets and serve as a source of iron and copper, we compared the anemia-curing properties of a number of canned strained vegetables[2] with prunes and calves' liver on an equivalent iron basis. Copper determinations were made to note any correlation with the relative value of the foods.

EXPERIMENTAL

The foods were dried, ground and stored in bottles until used for analysis or feeding. Iron determinations were made upon the dried food by the method of Stugart (4) and the results used in computing the daily portion to be fed. The copper content was determined by the Biazzo method as modified by Elvehjem and Lindow (5). Special care throughout the analyses was taken to avoid contamination from any source and possible loss in ashing. Analyses were made also of the milk used; this was raw milk[3] from a Holstein cow milked into chemically-clean glass jars from which samples were removed for analysis and feeding. Results showed this milk to have a low iron and copper content, 0.31 mgm. iron and 0.23 mgm. copper per kilogram.

Experimental animals were reared from stock rats fed a modified Steenbock stock ration (6). When the young began to open their eyes, the mother and young were placed on screens and fed only whole milk in their cage. The mother was removed to another cage twice daily for the grain ration as suggested by Elvehjem and Kemmerer (7). At the age of 24 to 25 days, and weighing 25 to 45 gms., the young were placed in

[1] Financed by a grant from the Gerber Products Company. Received for publication October 25, 1933.

[2] Supplied by the Gerber Products Company.

[3] Thanks are due the Dairy Department of the College for the milk and for their careful handling of it.

individual cages. These cages were made of heavily galvanized iron screen with false bottoms and had been in use only a few months. Pans and screens were changed twice weekly. As indicated by the work of Skinner, Steenbock and Peterson (8) and Geraghy, Underhill, Orten and Lewis (9), such cages may be used in anemia studies without introducing an error. The whole raw milk was fed *ad libitum* and no consumption records were kept. In addition, $\frac{1}{2}$ c.c. cod liver oil was given twice a week. Hemoglobin determinations were begun after the rats showed signs of being anemic, using the Newcomer method with a Bausch and Lomb calibrated filter as standard. The blood was taken from a freely flowing drop obtained by clipping the end of the tail which was then seared with a hot spatula to prevent continued bleeding. The supplemental feedings were begun when the hemoglobin content was at or below 4 gms. per 100 c.c. of blood, and were continued 5 weeks.

For comparison, negative controls from several litters were continued on the milk and cod liver oil diet, and other rats designated "iron and copper controls" were given solutions of iron chloride and copper sulfate. The iron chloride was prepared from analytical iron wire and purified by the method described by Waddell, Steenbock and Hart (10).

RESULTS AND DISCUSSION

The results are presented in table 1, the foods being arranged in the order of their copper content. The marked effect of the supplements on growth is shown by the fact that the negative controls gained only 2.9 gms. per week, while the average weekly gain of the other rats was 14.9 gms. The hemoglobin response of the rats fed 0.4 mgm. iron was very rapid in all cases, and there was not a great difference in the recovery of the various groups. If, however, 14 gms. are taken as normal hemoglobin concentration, the time in which that value was attained is in the reverse order of that of the copper content of the supplement, with the exception of green beans. These values on 0.4 mgm. iron show that although the rats fed green beans attained normal hemoglobin most rapidly, they were unable to maintain it and the final value was the lowest for all groups. It is interesting to note that the "iron and copper controls," whether receiving 0.4 mgm. or 0.1 mgm. iron, responded approximately the same as those fed peas and spinach having equivalent amounts of iron and copper. Thus, any organic factor is ruled out.

Since a slower hemoglobin response might emphasize any differences present which a rapid recovery would not elicit, other rats were fed 0.1 mgm. iron daily, comparing the vegetables with calves' liver and prunes. The

response was very slow on this limited amount of iron but, except for green beans, was in the same general order as the copper content. We have no data upon which to offer an explanation for the results of the tests upon green beans. In liver, with its high copper content, the limiting factor evidently is iron, since part of the iron is in the form of hematin and hence, according to Elvehjem (11), less available for hemoglobin

TABLE 1

Record of anemic rats fed iron and copper from various sources

SUPPLEMENT	DAILY AMOUNT				NUMBER OF RATS	WEIGHT* AT BEGINNING OF 5 WEEKS' TEST	AVERAGE WEEKLY GAIN*	CONCENTRATION HEMOGLOBIN* FOR EACH WEEK OF TEST						TOTAL GAIN* IN HEMOGLOBIN
	Dried food	Approximate equivalent of canned foods	Iron	Copper				Initial	1st	2nd	3rd	4th	5th	
	gms.	*gms.*	*mgms.*	*mgms.*		*gms.*	*gms.*	*gms. per 100 cc. blood*						*gms. per 100 cc. blood*
Iron and copper salts			0.4	0.050	4	61.0	11.9	3.7	10.2	12.9	13.8	14.1	14.5	10.8
Tomatoes	1.86	20.0	0.4	0.076	5	72.8	18.4	3.4	8.0	11.7	12.7	14.0	13.5	10.1
Green beans	2.42	39.7	0.4	0.058	7	53.0	14.2	3.7	7.9	12.2	14.0	12.6	13.2	9.5
Peas	2.62	21.2	0.4	0.053	7	51.6	17.2	3.7	7.9	12.7	13.7	13.8	14.5	10.8
Spinach	1.57	23.9	0.4	0.052	6	63.0	11.6	4.0	7.1	11.0	12.8	13.8	14.2	10.2
Vegetable soup	2.54		0.4	0.035	7	60.0	15.7	3.7	7.2	9.9	11.2	13.0	13.6	9.9
Liver	0.495	1.83†	0.1	0.073	6	66.3	16.5	3.5	5.8	8.1	8.5	9.3	9.6	6.1
Tomatoes	0.465	5.00	0.1	0.019	6	64.8	12.5	3.3	5.3	5.8	8.0	9.0	9.4	6.1
Green beans	0.605	9.93	0.1	0.015	6	67.3	14.3	3.6	4.5	5.3	6.2	6.7	7.5	3.9
Peas	0.655	5.30	0.1	0.013	7	68.6	15.5	3.7	4.9	6.0	7.8	8.8	9.6	5.9
Spinach	0.393	5.98	0.1	0.013	5	70.8	15.6	3.7	4.4	5.3	7.1	8.2	8.3	4.6
Vegetable soup	0.635		0.1	0.009	5	72.4	18.1	3.6	4.3	5.1	6.1	7.0	7.7	4.1
Prunes	0.441	1.77	0.1	0.006	5	69.3	12.1	3.3	3.6	4.9	5.4	5.7	5.3	2.0
Iron and copper salts			0.1	0.010	5	66.6	16.9	3.5	5.3	7.3	8.4	8.9	8.7	5.2
None					6	67.2	2.9	4.0	3.5	3.4	3.9	4.2	4.7	0.7

* Average for group.

† Fresh.

production in the rat. The data from these rat tests indicate that, while the potency varies to some extent with copper content, a variety of these foods which supplies the iron requirement also gives an adequate amount of copper for rapid hemoglobin production.

SUMMARY

The addition of a dried vegetable, prunes, or calves' liver to the milk and cod liver oil diet of anemic rats resulted in marked acceleration of

growth, even when anemia was not entirely cured. Rapid curing of nutritional anemia in rats resulted from feeding adequate amounts of dried vegetables or equivalent quantities of iron and copper salts. Except for green beans and liver, the hemoglobin response, whether upon the 0.4 mgm. or 0.1 mgm. iron level, was of the same general order as the copper content. Assuming the analogy of true nutritional anemia in the human and in the rat, these tests suggest the beneficial effects of vegetable feeding as sources of iron and copper in infant diets.

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A METHOD FOR COMPARING THE COST OF FRESH AND CANNED VEGETABLES USED IN INSTITUTIONS

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THE important problem of the relative cost of using fresh or canned vegetables in the institution has been previously investigated, notably by Quast (1, 2). For these studies, large quantities of food were used to obtain the findings, which included: per cent of waste in vegetable preparation; minutes per pound required for preparation of fresh vegetables; and drained weight of canned vegetables. From such data, comparative costs for the fresh and canned vegetables are usually calculated, using prices prevailing at the time the study is made. These figures should be of practical value if one may assume that fresh and canned products of similar character and grade are available, that workers prepare vegetables with the same skill and speed, and that figures for waste in preparing the fresh vegetable (as purchased, A. P.) for serving (edible portion, E. P.) or in draining the canned vegetable (A. P.) for serving (E. P.) hold in other institutions. However, practical application of the data would always require recalculation of results in terms of prices existing at the moment.

It seemed possible to develop a method whereby valuable material of this type could be presented in a permanently useful form, so that comparisons of cost might be made quickly without time-consuming calculations. The charts here described were prepared with this in view and include the three important variables, the cost of labor, the price of fresh vegetables and the price of canned vegetables. Provision has been made for easy comparisons of the cost of the canned, and of the fresh product.

The preparation of a chart may be described in detail. The data of Quast (1, 2) were used to secure the necessary figures, examples of which are as follows:

	LBS. FRESH VEGETABLE REQUIRED TO MAKE 1 LB. E. P.			MINUTES REQUIRED TO PREPARE AMOUNT TO MAKE 1 LB. E. P.			LBS. OF THE CANNED PRODUCT TO MAKE 1 LB. OF THE DRAINED VEGETABLE		
	Total fresh wt. A. P.	Total prepared wt. E. P.		Total time	Total prepared wt. E. P.		Av. wt. contents of can	Av. drained wt.	
	lbs.	*lbs.*		*min.*	*lbs.*		*lbs.*	*lbs.*	
String beans	68.25	÷ 63.19	= 1.08	365	÷ 63.19	= 5.78	8.56	÷ 4.69	= 1.83
Spinach	113.37	÷ 77.50	= 1.46	253	÷ 77.50	= 3.26	7.98	÷ 4.36	= 1.83
Peas	155.31	÷ 74.88	= 2.21	1980	÷ 74.88	= 26.44	6.56	÷ 4.25	= 1.54

In preparing figure 1 for string beans, lines representing conditions when the fresh string beans could be prepared to serve at \$0.05, \$0.10, \$0.15, etc. per pound, E. P., were next located, using the general equation:

$$1.08 \times \text{price of fresh product per lb., A. P.} + \frac{5.78}{60} \times \text{cost of labor per hour} = \begin{cases} \$0.05 \text{ or} \\ \$0.10 \text{ or} \\ \$0.15 \text{ etc.} \end{cases}$$

Two points were secured for the location of each line, by letting one variable = 0 and solving for the other.

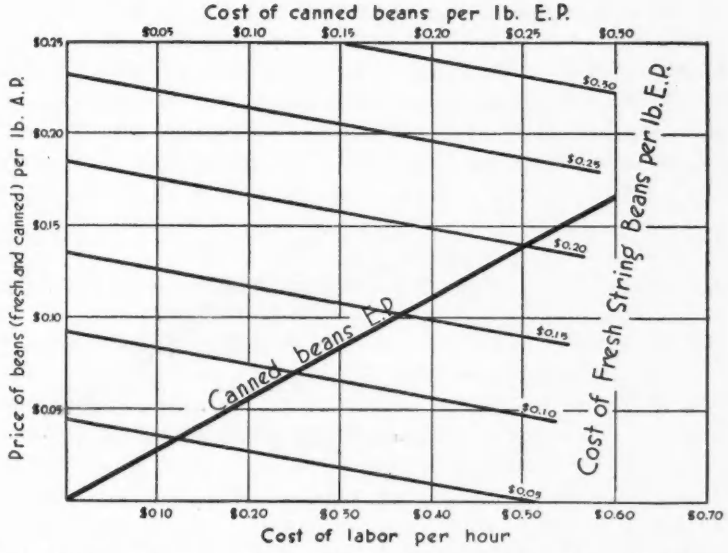

FIG. 1. CHART FOR COMPARING COSTS OF FRESH AND CANNED STRING BEANS, FOR USE IN INSTITUTIONS

Costs on canned beans, ready to serve, were calculated from the equation:

$$1.83 \times \text{price of canned product per lb. A. P.} = \text{cost of canned product per lb., E. P.}$$

The line was located by means of two points, obtained by substituting prices in the above equation and solving for the cost per pound, E. P.

The prepared chart may be read quickly at any time, the three variables being known. For example, if fresh string beans were \$0.04 per pound, labor \$0.35 per hour, and canned string beans \$0.06 per pound,

fresh string beans will cost, E. P., about $0.075 per pound (following the $0.04 level from the scale on the left to its intersection with the $0.35 per hour line, the intersection lying about half-way between the $0.05 and $0.10 diagonal lines for cost of the fresh product) and the canned beans will cost about $0.11 per pound, E. P. (following the $0.06 level from the scale on the left to its intersection with the diagonal for canned beans ready to serve, this intersection being at a point corresponding to $0.11 on the upper scale where costs of canned beans, E. P., may be read). In this case, the fresh beans would cost at least one-fourth less than the canned product.

Other data of this type could be used to prepare similar charts, their value being dependent upon the reliability of the figures used in making the calculations. Using the method described, we have prepared from the data of Quast (1, 2) a series of charts for rapid comparison of the cost of fresh and canned vegetables used in institutions.

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EDITORIAL

Dorothy Stewart Waller

1895-1933

Dorothy Stewart Waller, beloved by her friends and associates for her personal charm, and respected by her medical and professional colleagues for her brilliancy and ability, died at her home in Ann Arbor, Michigan, December 14, 1933. She was born in Delavan, Wisconsin, May 12, 1895, and attended school there until ready for college. She then took the course in home economics at Milwaukee-Downer College, with nutrition as her major interest. After further professional training in Chicago hospitals she was appointed, in 1919, therapeutic dietitian at the University Hospital in Ann Arbor. She received the degree of A.B. from the University of Michigan in 1925, and in 1932 was the first to be granted the degree of master of science in nutrition at that institution. Her thesis was published in part, with Dr. L. H. Newburgh, in the *Journal of Clinical Investigation*, September, 1932, and in part in this JOURNAL, July, 1932.

Shortly after she came to the University Hospital in 1919, Dr. Newburgh, who was developing his theories concerning the dietary treatment of diabetes mellitus, asked her to convert the diet prescriptions he wished to use experimentally into menus acceptable to the patients. The success she achieved in dealing with this sharply limited and unusual requirement is common knowledge to dietitians. Some of her results were published in *Modern Hospital* and in *Hospital Management* during 1922. In 1923, when a metabolic unit was given formal recognition at the University Hospital, she was appointed to serve as dietitian in this investigative field. In addition to the publications previously mentioned, popularized articles by Mrs. Waller have appeared in *The Ladies Home Journal*. Everyone who has dealt with diet as a therapeutic agent, or as an experimental tool, is grateful to her for the preparation of her most usable tables in *Nutritive Value of Foods*.

On June 10, 1926, she was married to Dr. H. G. Waller, a graduate of the University of Michigan and a member of the faculty of the Department of Internal Medicine.

In the fall of 1926, Mrs. Waller became dietitian at The Simpson Memorial Institute for Medical Investigation, in Ann Arbor. She held this position until 1929 when she took over the development and management of a diet therapy clinic. By 1931 she was finally able to realize an ambition. She devoted this year to laboratory investigation of a metabolic

problem, and this work became the subject of her master's thesis. When, in 1932, she was offered the position of director of the Department of Dietetics and Housekeeping at University Hospital, she accepted it largely in order to have the opportunity of developing a school of dietetics that approached her ideal.

During her short term as director of this department, she was able to advance its professional standing in several ways. She succeeded in working out a program with the Graduate School of the University, whereby properly qualified dietitians may secure the degree of master of science in nutrition—a distinctly new opportunity at this University. Already three recent graduates of Mrs. Waller's training course for dietitians are enrolled in this post-graduate course of study. Not only did Mrs. Waller arrange the series of courses leading to this advanced degree, but she secured several valuable fellowships that made it possible for these young women to prepare themselves more adequately for their chosen field.

Since 1923 Mrs. Waller had given a regularly scheduled course in dietetics to medical students. In recognition of this service she was made an instructor of dietetics in the Medical School in 1925, a rank which she held at the time of her death.

For several years she was a faithful member of the board of this JOURNAL and had served as national chairman of the Diet Therapy Section from 1930 to 1932. Mrs. Waller was a charter member of the Southeastern Michigan and the Ann Arbor Dietetic Associations, and was the first president of the Michigan State Dietetic Association.

FURTHERING HOSPITAL ADVANCEMENT

The American Dietetic Association, in its effort to maintain suitable standards for the hospital training of student dietitians, has followed the lead of older organizations such as the American Medical Association and the National League for Nursing Education. It was in October, 1927, that an outline of a standard course was approved by the Association, and the first published list of hospitals giving approved training for student dietitians appeared in the March, 1928, JOURNAL.

The American Medical Association, in its classification of hospitals, is concerned with a critical appraisal of a specific function of the hospital—the educational facilities afforded therein for the medical intern and resident. It was in the early part of the present century that the Association, through its Council on Medical Education, set standards for the classification of medical schools. At that time there was a large number,

almost 200, in the United States, and they were to a great extent proprietary in nature. The classification of medical schools resulted in eliminating a large number which could not meet Class A or B standards. As a result, there are now 77 Class A medical schools in the United States. Shortly after this inception, the Council on Medical Education became the Council on Medical Education and Hospitals and directed its efforts to the survey and approval of hospitals with regard to intern training and residencies. Today 689 hospitals have been approved for intern training, and 359 approved for residencies.

There are two other national organizations whose sympathetic attitude towards the development and improvement of the hospital dietary department is part of their creed of service to the patient, and who concern themselves with the functions of the hospital as a whole—the American College of Surgeons and the American Hospital Association. The latter aims at the promotion and development of all phases of the institution in such a manner as will increase its efficiency of administration and render good service to the patient. The American Hospital Association does not attempt to rate or classify hospitals, but accepts the approved list of other organizations and assists hospitals in their efforts to meet these accepted standards.

The American College of Surgeons has a comprehensive approach, in that standards for the entire hospital are viewed in the light of the service rendered to the patient—"*the proper care of the sick and injured.*" Although this fundamental idea of service upon which the movement was originally based has been in effect for only sixteen years, in this comparatively short time the percentage of approved institutions has risen from 12.9 per cent, in 1918, to 67 per cent, in 1933, and the original list of 89 approved institutions has now increased to 2,384 as of October 1, 1933. To be sure, public demands have developed hospital standards, but the proper working out of these demands has been influenced by the "minimum standard"[1] of the American College of Surgeons.

The purpose of the list of hospitals approved by the American Dietetic Association for student dietitian training is directed toward improving the standards for such training, and therefore has the educational limits of the American Medical Association listing. Hospitals desiring to be placed on this list for approved training of student dietitians must first be on the approved list of the American College of Surgeons, and must have an accredited training school for nurses or be able to affiliate with

[1] The provisions of this minimum standard are stated on pp. 3 and 4 of the 16th Annual Hospital Standardization Report of the American College of Surgeons, Oct. 1, 1933.

one, and in addition must have at least one hundred beds, and employ not less than two trained dietitians. The training course must cover a minimum of eight months, to be divided as follows: (1) one-third in general administrative duties connected with the food service for wards and private patients, staff and employees; (2) one-third in diet therapy in kitchen, serving pantries and wards, this service to include some experience in clinical laboratories and in the metabolism units; (3) one-third in infant and child feeding, in teaching hospital patients, nurses, and outpatients, and in pre-natal and well baby clinics. In addition to this general plan, there must be opportunity in each service for observation, practice under supervision, and the assuming of responsibility; there must be facilities for attendance at medical lectures for staff, medical students, or student nurses, in addition to regular department seminars; opportunities must be provided to visit other hospitals, hotels, tea rooms and cafeterias, markets, and public health agencies; and possibilities must exist for extensive medical reading. Detailed and comprehensive training in administrative duties is required for student dietitians, as well as wide experience in the practical application of diet therapy and practice in infant and child feeding. Finally, this student apprenticeship requires active participation in teaching through attendance at lectures to student nurses and conferences on general organization of such courses; it demands the preparation of certain lectures and laboratory lessons with the attendant responsibility of conducting these lessons, and the teaching of clinic patients.

The American College of Surgeons, in living up to its creed of service to the patient, has long emphasized the importance of the dietary department. The following abstract from the College's annual report offers a comprehensive picture of the present scope of this department:

> Every approved hospital requires a well organized dietary department under the supervision of a competent graduate dietitian. With increased knowledge of the part diet plays in the deficiency diseases and in disorders of metabolism it has become imperative to employ only dietitians who are graduates of accredited schools. The modern dietitian is expected to have a sound theoretical knowledge of food chemistry and scientific dieting. Furthermore, she cannot be regarded as fully competent unless she possesses a basic knowledge of planning and equipping a dietary department and how to handle the administrative problems of the department such as food buying, storage, and departmental accounting. She must be an economist with a well balanced viewpoint regarding efficiency and economy.
>
> The dietitian has three major duties, the first of which is administrative. She must be in close contact with the business department of the hospital

as she is responsible for spending approximately 25 per cent of the total hospital appropriation. It is her duty to regulate the food budget so as to effect every possible economy and at the same time maintain a high standard of food service. She should be skilled in practical cookery, in food values, in seeing that food is attractively prepared and served, in keeping menus well balanced, and in directing employees.

Her second duty is scientific. She must work in close coöperation with the medical staff. In the observation, diagnosis, and treatment of an increasingly large number of diseases she is a valuable aid to the clinician. Indeed, in such diseases as diabetes, anemia, and others in which treatment is almost entirely dependent upon proper diet, her services have become indispensable to the scientific practice of medicine. Her work in diet therapy brings her into close association with the laboratory worker; hence, between the dietary department and the clinical laboratory there should be the greatest possible coöperation.

Education is one of the duties of the dietitian. She is expected to instruct student nurses and student dietitians. Dietetics can be taught properly only by graduate dietitians who have had special training in the scientific and practical aspects of the work. The dietitian and her students should have access to a classroom equipped with the necessary facilities for practical laboratory work in hospital dietetics.

The American College of Surgeons in developing its Hospital Standardization program submits the following recommendations for the efficient organization and functioning of the dietary department:

1. That there shall be a properly organized dietary department under the direction of a competent graduate dietitian whose training conforms to standards approved by the American Dietetic Association, and that this department shall be responsible for (a) the efficient administration of the general food problem; (b) the scientific dieting of patients; (c) the education of the student nurse in hospital dietetics.
2. That there shall be an adequate administrative and technical staff, competent in their respective activities, and conforming to proper physical, mental, and character standards.
3. That the director of dietetics and the staff, with the approval and cooperation of the superintendent and governing body of the hospital, shall initiate and develop rules and regulations pertaining to the administrative and professional policies of the department, and that these rules and regulations specifically provide for (a) departmental and (b) interdepartmental conferences at regular intervals to review the work of the department for the purpose of improving the service and general efficiency.
4. That an adequate system of administrative, financial, clinical, and technical records shall be provided.
5. That adequate administrative and teaching facilities shall be provided for the dietary department, these to include: (a) the necessary physical accommodation and equipment for dietitian's office, kitchens, storage, refrigeration, and other service requirements; (b) a well equipped classroom and laboratory for the education of student nurses.

The dietitian is receiving increasing recognition in the promotion of health and the prevention of disease. Not only does she act in this rôle with the individual patient but her contact with the family, the school child, the student, and various other groups through educating them along the lines of sound dieting guides their future physical condition. The nutrition clinic, an innovation of recent years, renders a valuable service in the care of ambulatory patients. In this clinic the dietitian has opportunity to assist the clinician in guiding the course of diet for the patient. Patients are referred to the clinic for consultation and advice regarding the diet to be followed in the treatment of their disease.

The field of diet therapy and food administration offers much opportunity for further development. This will best be achieved through well organized dietary departments in standardized hospitals under supervision of competent graduate dietitians coöperating with the management and medical staff in the administrative and scientific activities of the institution.

Finally, it must be borne in mind that the food service has much to do with the satisfied patient. Since this is so important a factor in the well being of the patient it should be given serious consideration.

"Too Much Acid"[1]

The practice of medicine has always been rife with ideas, fads and fancies about diet. This was true of the medicine of the ancients, the tribal witch doctors, and the American Indian medicine men. While simple concoctions of herbs, berries, roots, leaves and flowers characterized the earlier attempts at nutritional therapy, extreme complexity marks present practices because of the many discoveries in the science of nutrition and the resultant stimulation of food fads and misconstrued theories that defy extermination. The great advances that have been made in our knowledge of nutrition as a science have led, unfortunately, to indiscriminate prescriptions of freak diets by zealots with but limited knowledge of the basic food requirements of the body. Many of these, writing in the daily press, have led a diet-loving public along nutritionally uncharted paths, and commercial concerns have been quick to realize on the sale of accessory food concentrates of dubious value.

The physician, since his advice carries weight with his patients, has been blamed, not only for the perpetuation of many old ideas about nutrition, but also for the adoption of many of the present unsound dietary practices and food fads. Most food fads enjoy their day of prominence only to die and be succeeded by new ones. Some, like the vegetarian fad, survive with minor variations through centuries. We have the

[1] Based on a paper by William C. Boeck, M.D., F.A.C.P., read before the Southern Branch of the California Dietetic Association, Los Angeles, California.

vegetarian of today who refrains from animal protein, especially meat, either because of religious scruples or because he believes he will "live longer or more healthily". He may have been told that meat was "hard on the kidneys", and that he might avoid Bright's disease or high blood pressure if he excluded it from his diet. It is a common medical practice today to advise patients, in many instances, to eat meats occasionally, but never *red* meats—white meat of chicken is always safe!

With the advent of the "iron age of nutrition", anemia, asthenia and general debility gradually succumbed to spinach, and the grape growers provided five-cent cartons of seedless raisins and advertised, "Have you had your iron to-day?" But people continued to get sick, and the magic password "autointoxication" was coined to save mankind. Dieting to provide good elimination was not enough; our colonic flora must be changed. Dairy companies thrived, and acidophilus organisms came in candied preparations for the finicky who could not imbibe milk. Soon we had a nation of acidophilus-milk-drinking patients, until some grew sceptical and others bored.

Then, with appropriate flourishes, came a diet therapy pronunciatmento that for the moment submerged all others—the average diet of the American people was lacking in alkaline ash-producing foods, we were eating "too much acid"! Ills were attributed wholesale to this habitual acid diet, and that terrible condition known as "acidosis" became psychically pandemic. Acidosis caused such symptoms as malaise, lassitude, nausea or vomiting, loss of appetite, headaches, asthenia, sleeplessness, muscle aches, acid mouth, sour stomach, acid urine, acid sweat, sour disposition, high blood pressure and nephritis; since nearly everyone had experienced these symptoms, people became "acid-minded". They knew "by the way they felt" when they had too much "acid in their system".

The newspapers swallowed the idea, and citrus fruit growers disgorged advice to an acidotic public on eating oranges, grapefruit and lemons. Many physicians and dentists became converts and perpetuated this nutritional theory of the origin of disease.

But to the critically-minded physician, familiar with the metabolic changes incident to eating a balanced diet in which the acid-ash foods may predominate, the acidosis theory failed.[2] Such a fascinating theory persists with the gullible, however, and people still have ills which are due to "too much acid" in their systems. They have long ago eliminated

[2] *See* Sherman, H. C., *Chemistry of Food and Nutrition*, p. 280 (Ed.).

meat, eggs and cereals from their diet, and now eat lima bean bread, but the so-called symptoms of acidosis are perhaps as common with the acid-alkaline balancers as among those who eat untrammelled.

Acid stomach, water-brash, heartburn, belching, etc., will doubtless continue to be due to "too much acid in the system from eating too much acid food". Yet studies have shown how extremely wide the normal variation in gastric acid secretion values is, and how often the secretions may have little relation to the character of the average diet, but may be attributed instead to neurotic tendencies or to chronic nervous exhaustion and fatigue, provided that organic disease has been excluded.

In hypertensive heart disease the practice has been to restrict the protein intake, and favor a predominantly alkaline-ash diet, "to spare the kidney and arterial system from as much work and irritation as possible". Newburgh and Marsh,[3] Polvogt, MacCollum and Simmonds,[4] and Evans and Risley[5] reported the presence of glomerular and tubular nephritic changes in the kidneys of laboratory animals that had been on a long-continued high protein (acid-ash) diet. Their results, however, according to DuBois,[6] were "due not so much to the high protein ration, as to unsuitable animals or mixtures of food. Furthermore, the studies of Osborne and Mendel,[7] Maclean, Smith and Urquhart,[8] Addis, McKay and McKay[9] and others, showed that such a diet might cause some hypertrophy of the kidneys, but no evidence of nephritis.

Studies on man, however, may be more informative. Thomas[10] observed a low incidence of high blood pressure among 142 adult Eskimos of Labrador, for only 8 showed a systolic pressure over 140, and the maximum was 170. Edema of nephritic origin was found in only one case.

The observations of McClellan and DuBois[11] did not reveal any evidence of kidney damage on meat-fat diets. On the other hand, McCay[12]

[3] Newburgh, L. H., and Marsh, P. L.: Arch. Int. Med. 36: 682, 1925.

[4] Polvogt, L. M., McCollum, E. V., and Simmonds, N.: Johns Hopkins Hosp. Bull. 34: 168, 1923.

[5] Evans, N., and Risley, E. H.: California and West. Med. 23: 437, 1925.

[6] DuBois, E. F.: J. Am. Dietet. A. 4: 53, 1928.

[7] Osborne, T. B., and Mendel, L. B.: J. Biol. Chem. 59: 13, 1924; and Am. J. Physiol. 68: 143, 1924.

[8] Maclean, H., and Smith, J. F., and Urquhart, A. L.: Brit. J. Exper. Path. 7: 360, 1926.

[9] Addis, T., MacKay, E. M., and MacKay, L. L.: J. Biol. Chem. 71: 139, 1926.

[10] Thomas, W. A.: J. A. M. A. 88: 1559, 1927.

[11] McClellan, W. S., and DuBois, E. F.: J. Biol. Chem. 87: 65, 1930.

[12] McCay, D.: *The Protein Element in Nutrition.* New York: Longmans, Green and Co., 1912.

feels that the great prevalence of kidney disease in India among the Bengali tribe is due to the low protein intake. In view of this evidence, it seems quite safe to allow patients with hypertension a selective normal diet that fulfills their ideal caloric requirements, and avoid concern about the ratio of acid to alkaline-ash foods.

Today, according to Boeck, we are seeing a gradual change in the dietary treatment of chronic nephritis, and we know that protein in excess of 50 grams daily does not necessarily cause any further injury to the kidneys in persons with chronic nephritis without edema, except in those terminal and severe cases characterized by a marked retention of non-protein nitrogen in the blood. In these there may be an acidosis, due to the fact that the normal function of the kidneys to make ammonia, which combines with the non-volatile acid radicles before their excretion, is seriously impaired. Consequently, these acids are excreted in combination with plasma-base, thus causing a lowered alkaline-reserve of the blood, and acidosis. In such instances a diet liberal in meat and eggs would be contra-indicated, since it would be likely to increase the degree of acidosis.

Epstein[13] has shown that it is advisable to prescribe a high protein diet to patients with nephrosis, and this practice has been extended to other types of chronic nephritis with edema in which there has been a loss of serum-protein due to the large amount of albumin in the urine. Often these cases have been on a protein starvation diet. Likewise, edema may occur in people without nephritis who have been restricting their protein intake over a long period, and the feeding of a high protein diet may restore normal serum protein values, and cause diuresis. We may speed up the process of increasing the so-called "acid in the system", Boeck says, by administering certain acid-salts such as ammonium chloride or ammonium nitrate.

McCann[14] has reported the clinical improvement of persons with acute hemorrhagic nephritis resulting from a high protein diet (75–150 grams daily). No elevation of blood pressure or acidosis occurred, and there was an actual decrease of the non-protein nitrogen of the blood. There was no apparently added damage to the kidneys from the extra protein in the diet, because most of it was deposited in the body and not excreted as albumin.

We are now in the throes of another era of nutrition, the vitamin era, and it is increasingly important that conservative information regarding the science of nutrition in its relation to health and disease be given to

[13] Epstein, A. A.: Am. J. M. Sc. 154: 638, 1917.
[14] McCann, W. S.: Ann. Int. Med. 5: 579, 1931.

the laity in order to avoid another situation like the "too much acid in their food or in their system". Occasional joint meetings of physicians, especially internists, together with dietitians, nurses, and biochemists and physiologists who may be interested, should promote the health dissemination of our newer knowledge of nutrition. Then the essentials for the foundation of a normal diet for persons in good health, and the requisite changes for persons with various illnesses, would become better known to all physicians, nurses and dietitians. Scientific articles on nutrition should replace the syndicated food fad columns in our daily papers, and discourage the adoption of fanatical, and pseudo-scientific diets.

The "Week of Careme"

The first week of March, to the epicures of Paris, means seven days of superb memorial cooking to the memory of Antonin Careme, author of *Maitre d'Hôtel Française*, and chef to Talleyrand. He died a century ago, poor and old, but with immortal fame among his countrymen for his culinary creations, and for refusing to leave Paris for London to cook for George IV, King of England. After Napoleon returned from Elba, Czar Alexander I of Russia came to Paris, and conferences followed. Talleyrand, under the mellowing aura of sublime food, succeeded in persuading the victorious ruler that the Bourbons must return to save France, and it was the cookery of Careme that strengthened his arguments. Later Napoleon signed the Act of Abdication at Fontainebleau. After Waterloo, when Talleyrand was called to the Congress of Vienna, he was told, "Be sure and bring your chef", and Talleyrand again pled for the Bourbons over Careme's delicious concoctions. Shielded by this bulwark of cookery, Louis XVIII returned to the throne, and Metternich, the Austrian diplomat, tried in vain to persuade Careme to remain in Vienna.

While the artistry of food is a pertinent topic at all seasons in France, during the "Week of Careme", in Paris, eating becomes even more the serious business of the faithful. It is then that the nuances of favored dishes, immortalized by the names of their originators—Bechamel, Robert, Rechaud and Merillion—are discussed with a fervor befitting the noble art of cookery.

CURRENT COMMENT

The Administrative Field Widens

That the eating facilities of college groups must meet needs peculiar to such groups is adequately recognized in the recently published "Re-

port of Committee Appointed to Study the Eating Facilities at Amherst College."[1] Before preparing their recommendations, the committee investigated conditions at Cornell, University of Colorado, Dartmouth, Hamilton, Harvard, Lafayette, Princeton, Wesleyan, Williams, Yale, Andover, Deerfield and Exeter. The basic conclusion, which influenced their recommendations, was that "the College should be responsible for the physical well-being of its students, and that the careful and scientific selection, preparation, and serving of food, as well as the conditions under which it is prepared and served, is an important part of such responsibility."

The *modus operandi* of the feeding problem previously in vogue was reviewed. This included privately-operated boarding houses, two experiments with a college-operated commons, and the restaurants, cafeterias and lunch carts in the town. At the present time, twelve of the thirteen fraternities eat in groups, while about sixty per cent of the non-fraternity men eat at the Commons Club. The committee recognized that such a system had its advantages, including the opportunities offered to a number of men to earn their board by waiting on table, washing dishes, etc. It seemed to them, nevertheless, that the thirteen individually managed kitchens and the hiring of thirteen head chefs was not the most efficient way of handling the problem. They found that coöperative buying by a central purchasing agent had been tried at some colleges, but had not proved successful.

The committee recommended that the College erect a building for the dining facilities for the entire College body. These central eating halls would be served from a central modern kitchen and serving pantries under the direction of a thoroughly competent manager. Such an organization should be able to cater to all official functions of the fraternities, the classes, and the College. The committee placed great emphasis upon the need of a highly trained manager to be in charge of the entire organization. It is gratifying to note this continuously growing recognition of the need of trained personnel in the feeding of large groups, and the ever-widening field of opportunities for the administrative dietitian.

The Appeal of Home Cooking

For those guests who prefer old-fashioned American home cooking to the fare provided by French and Italian chefs, Mrs. Rebekah Hufcut, in her small kitchen in the Waldorf-Astoria, New York City, supervises the

[1] Amherst Alumni Council News, Supplement to Vol. VII, No. 2, December, 1933.

preparation of the dishes they desire. Mrs. Hufcut is a graduate of Teachers College, Columbia University, and for three years was the food editor of the Brooklyn *Eagle*. Her home kitchen is set apart from the other kitchens, and in it three women cooks prepare traditional American dishes. Mrs. Hufcut agrees with others who have done similar work that women cooks seem best able to give the proper touches to American dishes.

No short cuts are used in preparation of these dishes. Boston baked beans, after just the right kind of pea bean has been selected, are baked for twelve hours. The New England boiled dinner is built around corned beef, no other meat will do. Strawberry shortcake is made with biscuit dough, not sponge cake, and is served with the berries cut, not crushed, and with heavy, unwhipped cream. The clam chowder is made with milk and there are no misguided tomatoes to mar its perfection. In the fish chowder, made of haddock, a little salt pork is used. Rhode Island johnny cake, Yankee pot roast, baked Virginia ham, oyster pie, mutton pudding, Philadelphia scrapple, Maryland fried chicken with beaten biscuits, Carolina chicken pie, Wisconsin chicken cake, Pennsylvania Dutch apple cake, Boston cream pie, Indian pudding, cranberry roly poly—all are made according to the best traditions of the part of the country in which they originated.

Attention has been previously called in the JOURNAL to a somewhat similar type of work done by Marie Casteen of the Hotel Pennsylvania, New York City. The "experimental kitchen" and "home kitchen" suggest a field of activity for trained women in the large hotel, a type of work that men do not seem so well fitted to do.

BOOK REVIEWS

Metabolic Diseases and Their Treatment. By Erich Grafe, Professor of Medicine and Director of the Clinic of Medicine and Neurology at the University of Würzburg, Germany; translated by Margaret Galt Boise. Philadelphia: Lea and Febiger, 1933, pp. 551. Price $6.50.

That this volume has been translated from the German under the supervision of Dr. Eugene F. DuBois and his associate, Dr. Henry B. Richardson, vouches for its inherent worth. In the German edition the book was written chiefly because of the increased interest among the medical profession in the diseases of metabolism, due, perhaps, to the more secure footing in the treatment of diabetes. Although aware of the many excellent monographs and reviews on the subject of metabolism in American literature, Dr. Grafe believed that a condensed discussion for doctors and students would be of value. In this translation many revisions not appearing in the German edition have been made and the text brought up to date.

The book is divided into five parts, the first introducing the subject of metabolism and nutrition, discussing foodstuffs as energy producers, and outlining the chemical and physical action of various foodstuffs. The second part contains a discussion of the nature and treatment of nutritional disorders; here the general facts on undernutrition and its treatment, metabolism and diet in fever, vitamin deficiencies and their treatment are outlined, including special forms of artificial nutrition.

Part III covers metabolic diseases and their treatment, with especial emphasis on obesity, habitual undernutrition, and diabetes mellitus. The last mentioned condition is probably more exhaustively treated, from a research point of view, than in other available publications. Part IV discusses qualitative disturbances of protein metabolism and their treatment, including gout, alcaptonuria, cystinuria and aminuria.

Part V discusses disturbances of the water and mineral economy. The appendix covers disorders not strictly metabolic, such as calcareous diatheses, oxaluria, uraturia, phosphaturia, urinary lithiasis and calcinosis, and includes a table of metric equivalents.

Food-Borne Infections and Intoxications. By Fred W. Tanner, B.S., M.S., Ph.D. Champaign, Ill.: Twin City Printing Co., 1933, pp. 439. Price $5.50.

One or more gastrointestinal disturbances have been the common lot of practically every adult. These disorders have in the majority of instances been due to food-borne infections and toxins. In an earlier day such outbreaks may have been related to the formulation of certain religious laws of the orthodox. Others were explained on the basis of superstition. Many common beliefs regarding the probable sources of food poisoning have been carried down to the present day with little or no basis in fact. Tanner lists some of these erroneous impressions, *e.g.*, that meat pies were dangerous if the crust was not ventilated; that fish and milk would cause illness if eaten at the same meal. Ice cream and lobster should provide another suitable example. Canned foods, among the uninitiated, are still blamed for many gastrointestinal illnesses, yet according to Tanner and other authorities, commercially-canned products are among the safest foods available. Not a single outbreak of botulism has occurred in seven years from such a source. This, of course, does not apply to the majority of home-canned products.

The author stands firmly against the use of the misnomer, "ptomaine poisoning", and declares that we must look to the heat-stable gastrointestinal irritants belonging to the Staphylococcus and Salmonella groups for a better explanation of the major portion of outbreaks caused by foods.

This book should be invaluable to the dietitian concerned with the feeding of large or small groups, and should appear on the reference shelf of every dietary department and training school. Chapter 2 covers in detail the importance of the hygienic handling of food, the methods of cleaning table-

ware and disinfecting dishes, the relation of food handlers and common insects to the dissemination of disease, and the rôle of milk and water as sources of contamination.

Chapter 3 discusses metals used with foods and their possible relation to illness. Chapter 4 outlines the relation of certain plant products to illness in man, including lathyrism (discussed in the editorial section of the *Journal American Medical Association* for December 9, 1933). Other subjects covered are: the relation of animals and animal products to illness, including poisonous fish, mussel poisoning, trichinosis; food allergy; eberthella typhi in foods; with emphasis on its occurrence in ice cream and cold foods; the Salmonella group as a source of infection and poisoning; the proteus group and food poisoning; food-borne sources of tuberculosis; miscellaneous organisms and food infection; putrefaction of foods and illness, and botulism.

In view of the generally thorough treatment of the subject, it is regrettable that specific attention has not been given to the serious import of the Endamoeba histolytica, particularly at the present time.

Alcohol and Man. Ed. by Haven Emerson, M.D. New York: The Macmillan Company, 1933, pp. 451. Price $3.50.

The plan and execution of this symposium are unexcelled. The sixteen chapters, each contributed by one or several authorities in its special subject—authorities like Davenport and Stockard on heredity, Miles and Meyer on psychology and psychiatry—canvass every possible contact and grouping of contacts between ethyl hydroxide and the human being. Editorial supervision has minimized overlappings, at the same time providing enough cross-references between chapters to link complementary data and contrast opposing arguments.

Every contribution is eminently readable. None is polemic. All are serious in import, though one toxicologist allows himself a facetious aside (p. 136), a potatorian's progress sketched per unit of alcohol.

Alcohol as a food (p. 130) "can function in this manner only to the extent of the five or ten grams per hour that can be oxidized."

Therapeutic uses are discussed judiciously—the outmoded treatments of snakebite and sepsis, the differing indications in pneumonia, the limitations in diabetes and tuberculosis. Immunologic influences of alcohol are examined quantitatively. A valuable scale of toxic symptoms (p. 259) compares those seen throughout a range of 0.10 to 4.00 mgm. of alcohol per cc. of blood.

JAMES H. HUDDLESON, M.D.

Foods. By Margaret M. Justin, Lucile Osborn Rust, and Gladys E. Vail. Price $2.25. Boston: Houghton Mifflin Company, 1933, pp. 569.

This is an excellent text for food courses in colleges. The authors have presented accurate, carefully prepared subject matter in a very practical and usable form.

The book is divided into five units. The first comprises five problems in applied nutrition, delineating a state of good nutrition, the elements which affect it, and advice for correcting a state of poor nutrition. The second deals with foods, their preparation and use. It consists of nineteen problems giving a description of each food and the general directions for its preparation, but no recipes as the data may be applied to any recipe. The third unit treats of the planning, preparation, and serving of meals, and comprises seven problems which depict the various forms of service for food and the principles involved in menu planning. This is a cultural and very helpful chapter. Unit four is made up of twelve interesting and practical problems in marketing. Unit five has seven problems in food preservation, including pickles, jelly, preserves and dried and smoked foods. It also covers the general causes of spoilage. The appendix is made up of rules of conduct, table service, table manners and care of dishes and utensils.

The authors of this book have a wide and varied background of experience from which to draw and they have produced a delightfully comprehensive text which should be of real value to student and instructor, both as a text and as a reference book.

EMMA FEENEY.

Food Products. 3rd ed. By Henry C. Sherman, Ph.D., Sc.D. New York: The Macmillan Company, 1933, pp. 674. Price $3.00.

A new or a revised volume by Dr. Henry C. Sherman is always of major concern to students in the field of nutrition. The earlier editions of *Food Products* are widely known, and have served as references or texts in practically every school of home economics. As in the past, the present edition seeks to furnish sources for a broad general study of food and the chief types of food products.

The first and second chapters follow the plan of the previous edition in that they treat respectively of the principal constituents and functions of food, and the more general aspects of food control. Chapters follow on the chief kinds of food, and a final chapter discusses the best use of foods from the viewpoint of the student of nutrition and food economics.

New chapters in this edition are given to vegetables, fruits and nuts, thus increasing the chapters from thirteen to fifteen. Recent Government data on food composition, production, and consumption have been incorporated, and the tables on mineral elements and vitamin values have been revised and extended. Attention has been given to the economic, nutritional, sanitary and technological aspects of food products, and lists of suggested reading direct the reader to the extension of study along such lines as may best meet his needs. The text has been completely rewritten in the interest of conciseness and clarity. The appendix outlines the original food and drugs act, with the amendments up to and including July 8, 1930.

Foundations of Nutrition. Rev. ed. By Mary Swartz Rose, Ph.D. New York: The Macmillan Company, 1933, pp. 630. Price $3.00.

The previous edition of this book was reviewed in the JOURNAL for September, 1928. In the revised edition the author remarks that it is in the main true that researches of the past six years have only served to establish more firmly the subject matter presented in the 1927 edition. However, much additional knowledge along certain lines has necessitated complete revision of the earlier portions of the book dealing with the vitamins, and a separate chapter is now devoted to each one. The more extensive data now available on the factors of energy, protein and mineral elements have been subdivided into a larger number of chapters. The appendix includes a much amplified table of food values in "shares" and an extended and simplified tabulation of vitamin units. More than a hundred pages have been added to the book's size. This is a very welcome, up to date revision of an established and authoritative handbook by an author "who cannot be surpassed in breadth of experience and in ability."

Diet and Personality. By L. Jean Bogert, Ph.D. New York: The Macmillan Company, 1934, pp. 223. Price $2.00.

In this volume the author takes issue with "blanket prescriptions" for eating; a "good" diet cannot be prescribed *en masse*, but must be adjusted to the requirements of the bean pole, the roly poly, the irascible dyspeptic, the lusty trencherman, and the limp and languid, milk and sugar types. While the title of the book bears an unfortunate resemblance to another, the similarity ends with the titles. In Dr. Bogert's book it seems safe to assume that the personality is initiated in the chromosomes, and the diet merely enhances and serves as a bolster to nature's handiwork. In Dr. Berman's book, the diet acts on the "personality" glands and, presto—you have either a rabbity, or a lion-hearted, Jove-like personality at will.

This is more than just another thesis on diet, however, and shows an understanding of the hygienic requirements, other than suitable diet, in maintaining health. More than half of the book is devoted to a discussion of the following subjects; nervous strain; how to adapt oneself to city life; importance of posture; combating overfatigue; how to reduce susceptibility to infections; indigestion; constipation, underweight; and reducing diets. As a parting

shot, the final chapter is directed against a favorite target of the author's, food fads.

The book contains an introduction by Lafayette Mendel; this, and the reception accorded Dr. Bogert's previous book, attest the volume's soundness.

Diet and Dental Health. By Milton T. Hanke. Chicago: Univ. of Chicago Press, 1934, pp. 236. Price $4.00.

This volume represents the results of experimental dietary work with approximately 500 persons, and observations on 440 children at Mooseheart, Ill. Groups cooperating with Dr. Hanke in this research were the Chicago Dental Research Club, the Otho S. A. Sprague Memorial Institute at the University of Chicago, and the California Fruit Growers' Exchange, to whom Dr. Hanke expresses his gratitude for "the financial aid that they voluntarily rendered . . and for the unselfish spirit in which this was given." In leading up to his research findings, Dr. Hanke covers the subject of the philosophy of health and disease, dental structures and dental diseases, photographic presentation of the progress of dental caries and of various degrees of gingivitis and pyorrhea, histopathological changes in the dental structures associated with varying degrees of scurvy, effect of treatment in scurvy, and dietary investigations on patients.

Part II covers the well-known work of Dr. Hanke at Mooseheart, in which he reaches the conclusions: (1) that certain dietary deficiencies may be the ultimate cause of much of our gingivitis, pyorrhea, and dental caries; (2) that massive intakes of orange juice and some lemon juice added to a diet nearly adequate in all other respects, lead to a marked diminution of gingivitis with an arrest of about fifty per cent of the dental caries; (3) that these two conditions become rampant again when the citrus fruit intake is reduced to as little as three ounces a day; (4) that the intensity of the caries process is reduced by the administration of an adequate amount of citrus fruit juice to a diet that is nearly adequate in other respects, although such a diet does not completely remove the effects of the inherent tendency in all cases; and (5) that orange and lemon juice contains something that acts as a growth stimulus to children.

CURRENT LITERATURE

KATHLEEN M. LEWIS

American Journal Diseases of Children

Vol. 46, December, 1933

* Bone development of infants and young children in Puerto Rico. M. M. Eliot and E. B. Jackson.—p. 1237.

Vol. 47, January, 1934

Treatment of anemia in children with ferric and ferrous compounds, reduced iron and cupric sulphate. M. C. Lottrup.—p. 1.

* Treatment of obesity in a group of children. H. Mulier and A. Topper.—p. 25.

Calcium and phosphorus studies. D. H. Shelling and K. B. Hopper.—p. 61.

BONE DEVELOPMENT OF INFANTS AND YOUNG CHILDREN IN PUERTO RICO. A roentgenographic study of the bones of 584 Puerto Rican children from 1 to 34 months of age showed that rickets is a rare disease. The rate of growth in weight and height of the Puerto Rican children parallelled closely that of continental United States. The absence of rickets in Puerto Rico may be attributed primarily to the protective influence of sunlight. Ten per cent of the children showed osteoporosis which was associated with malnutrition and stunted growth.

TREATMENT OF OBESITY IN A GROUP OF CHILDREN. Twenty-five children, ranging from 8 to 13 years of age, with exogenous obesity, were treated with a low caloric, high protein diet. The salt and water intake was limited and the physical activity increased. The average loss of weight during the four and a half months' period was 13 pounds, while the average height increase amounted to 1½ inches in comparison with the expected growth of 1 inch for the same period. The basal metabolism remained normal. The children assumed better eating habits, felt better, had an increased capacity for physical activity and manifested an increased interest in school studies.

American Journal of Physiology

Vol. 106, December, 1933

Disturbances of reproduction and ovarian changes in the guinea pig in relation to vitamin C deficiency. M. M. Kramer, M. T. Harman and A. K. Brill.—p. 611.

Vol. 107, January, 1934

The fatty acids of human duodenal bile, and their quantitative separation, estimation and the effect of foodstuffs on their secretions. C. W. McClure, M. E. Huntsinger and A. T. Fernald.—p. 1.

* Fecal "fat" and its relation to fat in the diet. A. Krakower.—p. 49.

* Effects of administration of pure foodstuffs and inorganic substances on external secretory activities of the liver, pancreas and stomach. C. W. McClure, M. E. Huntsinger and A. T. Fernald.—p. 94.

* Zinc in the nutrition of the rat. W. R. Todd, A. A. Elvehjem and E. B. Hart.—p. 146.

Further observations of the vitamin A content of the livers of depancreatinized dogs and its relationship to the symptoms occurring in these animals. E. P. Ralli, G. Flaum, P. Joffe and G. Stueck.—p. 157.

FECAL "FAT" AND ITS RELATION TO FAT IN THE DIET. Four test diets of varying fat content were fed to 12 normal individuals for 4 day test periods. The excreted lipids were found to be uniform in composition, as judged by their iodine numbers, and thus differed from the fats in the diet which showed values from 8.2 to 125.8. Fecal lipids do not appear to represent a residue of fat in the diet, when given in moderate amounts, but may be excretions of the blood into the gastro-intestinal tract.

EFFECTS OF ADMINISTRATION OF PURE FOODSTUFFS AND INORGANIC SUBSTANCES ON EXTERNAL SECRETORY ACTIVITIES OF THE LIVER, PANCREAS AND STOMACH. Quantitative chemical studies were made on the composition of the biliary, pancreatic and gastric fractions of human duodenal contents obtained after the intraduodenal administration of pure foodstuffs and inorganic substances. The findings show that cottonseed oil is the most powerful stimulant to the secretion of concentrated bile; peptone, HCl and $MgSO_4$ occupying second place, while dextrose was neutral in its stimulative effects.

ZINC IN THE NUTRITION OF THE RAT. Young rats were fed a highly purified

synthetic ration containing all the known vitamins, essential mineral elements and 1.6 mgm. of zinc per kilo of dry weight. On this ration the growth of the rats was markedly inferior. Invariably there was an interference with the development of a normal fur coat. When ZnO or $ZnCl_2$ was added to the extent of 5.0 mgm. of zinc per 100 grams of ration, growth was accelerated.

American Journal of Public Health

Vol. 23, December, 1933

Proposed Federal Food and Drugs Act—Its public health features. W. S. Frisbie.—p. 1232.
Has diabetes become more prevalent? C. Bolduan.—p. 1282.
* Significance of copper and iron in blood restoration. C. A. Elvehjem.—p. 1285.

SIGNIFICANCE OF COPPER AND IRON IN BLOOD RESTORATION. Iron and copper are equally essential for hemoglobin formation since iron is a constituent of the molecule and copper acts in a catalytic capacity. The average diet supplies sufficient iron and copper for the maintenance of a normal blood stream in adults with normal hemoglobin requirements. With increased hemoglobin demands, many diets are low in these elements. The value of foods as sources of iron and copper depends upon the amount of available elements, not upon the total content. Iron and copper salts are effective for hemoglobin production.

Annals of Internal Medicine

Vol. 7, December, 1933

The familial incidence of peptic ulcer. H. H. Riecker.—p. 732.

Vol. 7, January, 1934

Thromboangiitis obliterans of patients with diabetes. B. T. Horton and F. N. Allan.—p. 799.
Irradiation treatment of hyperthyroidism. G. E. Pfahler.—p. 868.

Hotel Monthly

Vol. 41, December, 1934

Quick frozen fruits and vegetables. E. C. Winans and M. S. Ehlers.—p. 26.
The listing of wines on the menu. A. Shircliffe.—p. 53.

Vol. 42, January, 1934

The listing of wines on the menu. A. Shircliffe.—p. 44.

Journal of the American Medical Association

Vol. 101, December 2, 1933

* Insulin in the treatment of tuberculosis. F. M. Allen.—p. 1797.
Economic trends and the weight of children. Editorial.—p. 1804.

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* Dietary and medical management of diseases of the gall bladder. J. R. Twiss and C. H. Greene.—p. 1841.
New foods and drugs legislation. Editorial.—p. 1882.

Vol. 101, December 16, 1933

Cutaneous ulcers treated by the sulphydryl containing amino acid cysteine. L. A. Brunsting and D. G Simonsen.—p. 1937.
Unusual experience with amebic dysentery. K. Ikeda.—p. 1944.
Hyperinsulinism. S. Harris.—p. 1958.
he outlook in nutrition. Editorial.—p. 1971.
Pimento peppers and vitamin A. Current Comment.—p. 1972.

Vol. 101, December 23, 1933

Gestational polyneuritis. E. D. Plass and W. F. Mengert.—p. 2020.
Transmission of common colds by food. Current Comment.—p. 2054.

Vol. 101, December 30, 1933

"Available" iron in therapy. Editorial.—p. 2123.

Vol. 102, January 6, 1934

More crystalline enzymes. Editorial.—p. 46.
Nutrition in national emergencies. Editorial.—p. 46.
Bovine tuberculosis. Current Comment.—p. 48.

Vol. 102, January 13, 1934

Treatment of disease of the upper part of the digestive tract. J. F. Weir and W. Walters.—p. 93.

Vol. 102, January 20, 1934

* Types of nephritis and their management. H. A. Christian.—p. 169.

Vol. 102, January 27, 1934

Myasthenia gravis. W. M. Boothby.—p. 259.
The etiology and treatment of anemia in pregnancy. M. B. Strauss.—p. 281.
Fat and the diabetic patient. Editorial.—p. 294.
A dietary ingenuity. Current Comment.—p. 296.

INSULIN IN TUBERCULOSIS. Treatment of eighty non-diabetic tuberculosis cases, ranging from quiescent to severe, with insulin, produced marked gains in appetite, weight, strength, spirits and general comfort. The

insulin dosage was started at 5 units and gradually increased to 30 or 40 units three times daily. Forty-five patients showed an average gain of 25 pounds. Except in very advanced cases, this gain in weight and strength was entirely or largely retained after insulin was stopped. Insulin deserves a place in the treatment of tuberculosis because it improves nutrition and possibly alters the soil on which the tuberculosis infection develops. Experimental and clinical evidence prove that the internal secretion of the pancreas is related not merely to carbohydrate metabolism but to total metabolism and body weight. Insulin may therefore be regarded as a specific anabolic hormone.

DIETARY AND MEDICAL MANAGEMENT OF DISEASES OF THE GALL BLADDER. Five diets for various gall bladder conditions are given in full. The general principle of a bland diet is followed in each instance. When the patient is obese, a reduction diet is given. In the underweight patient every effort is made to increase the caloric intake by giving four or five small meals with intermediate nourishments. For those patients with an intolerance to fats, a low cholesterol, low fat diet is given. The cholesterol content of various foodstuffs is also listed.

HYPERINSULINISM, A DEFINITE DISEASE ENTITY. At least one hundred cases of hyperinsulinism have been reported in the last ten years. This clinical entity is the antithesis of diabetes mellitus and is characterized by hypoglycemia with its concomitant symptoms. This paper outlines the etiology, pathology, symptoms, diagnosis and treatment of the disease. Probably the most important predisposing cause of the pancreatitis that precedes both hyperinsulinism and diabetes, is a diet deficient in vitamins. The excessive use of sugars and starches may also be an exciting cause. The diet for hyperinsulinism must be adopted to nourish the patient properly. For an average adult a typical diet would contain 90–120 grams of carbohydrate, from 60–75 grams of protein and from 160–200 grams of fat, divided into five or seven feedings a day. Careful blood sugar studies should be made. It is as essential to teach food values to a patient with hyperinsulinism as to one with diabetes mellitus.

TYPES OF NEPHRITIS AND THEIR MANAGEMENT. Each author suggests a different classification of nephritis. A comparative schema of the various classifications designed by Dr. Christian shows that a few simple concepts underlie all these classifications. Ideas as to the management of nephritis have been considerably modified in recent years. We are now less concerned with the dietary constituents that theoretically increase the work of the kidney, and are more concerned with maintaining the nutrition of the patient at a high level. Except for the first week of an acute nephritis, only a moderate restriction of protein, salt and fluid is necessary with an otherwise normal diet. In chronic nephritis four factors influence the therapeutic and dietary management—edema, nitrogen retention, anemia and circulatory failure associated with hypertension. When edema is present, a restriction of salt and fluids is advisable. As nitrogen retention develops, lowering of food protein is indicated. Slighter degrees of anemia are combated with an adequate varied diet of the proper vitamin content. Iron in large doses should be administered. There is little to be done for the hypertension of nephritis.

Journal of Biological Chemistry

Vol. 103, December, 1933

* Metabolic studies of children with dental caries. J. D. Boyd, C. L. Drain and G. Stearns.—p. 327.

A study of the sparing action of fats on the vitamin B content of animal tissue. A. R. Kemmerer and H. Steenbock.—p. 353.

New formed hemoglobin and protein catabolism. F. S. Daft, F. S. Robscheit-Robbins and G. H. Whipple.—p. 495.

Yeast and liver preparations as a source of vitamin G (B_2). R. J. Block and L. R. Farquhar.—p. 643.

Vol. 104, January, 1934

* Necessary versus optimal intake of vitamin G (B_2). H. C. Sherman and L. N. Ellis.—p. 91.

Change in composition of bone of rats on a diet poor in inorganic constituents. R. O. Brooke, A. H. Smith and P. K. Smith.—p. 141.

METABOLIC STUDIES OF CHILDREN WITH DENTAL CARIES. Observations on three groups of children with 98 balance studies lead the authors to conclude that the levels of serum calcium and phosphorus, the acid-base relationships, and the chief inorganic constituents in saliva are not of primary significance in the production or prevention of dental caries. There appears to be a close correlation between metabolic efficiency of the body as a whole and the resistance of the teeth. Resistance to decay is dependent primarily upon factors operating from within the tooth.

NECESSARY VERSUS OPTIMAL INTAKE OF VITAMIN G (B_2). Vitamin G was fed, at four different levels of intake, to rats from weaning age to the completion of the breeding record. A superior vitality of the young and the extension of the period between the attainment of maturity and the onset of senility resulted from enriching the already adequate diet with vitamin G. These findings show that the optimal intake of vitamin G is much above the maintenance level.

Journal of Home Economics

Vol. 25, December, 1933

Bacterial studies of defrosted peas, spinach and lima beans. E. B. Brown.—p. 887.

Journal of Nutrition

Vol. 7, January, 1934

The ophthalmogenic properties of certain rations low in vitamin A. C. Baumann and H. Steenbock.—p. 41.

* The effect of acid ash and alkaline ash foodstuffs on the acid-base equilibrium of man. F. Bischoff, W. D. Sansum, M. L. Long and M. M. Dewar.—p. 51.

Protein, calcium and phosphorus intakes of college women as indicated by nitrogen, calcium and phosphorus outputs. M. M. Kramer, H. F. Evers, M. G. Fletcher and D. I. Gallemore.—p. 89.

Further experiments with cataract in albino rats resulting from the withdrawal of vitamin G (B_2) from the diet. P. L. Day and W. C. Langston.—p. 97.

THE EFFECT OF ACID ASH AND ALKALINE ASH FOODSTUFFS ON THE ACID-BASE EQUILIBRIUM OF MAN. Results presented in this paper show that the blood picture is not significantly changed by either excessively acid or excessively alkaline ash foodstuffs. The ingestion of 1 quart of milk, 1 quart of orange juice, or 1 pound of bananas produced no shift in the plasma pH or alkali reserve, while 1 pound of steak temporarily lowered the plasma bicarbonate significantly in only one of four subjects.

Modern Hospital

Vol. 41, December, 1933

Dietitian plays an important part in Christmas festivities. A. B. Lothe.—p. 102.

Simple system of dietary accounts serves as a constant check. F. E. Saville.—p. 108.

December dinner menus. W. H. Erickson.—p. 112.

Vol. 42, January, 1934

Central tray service has advantages over decentralized system. E. Hennecke.—p. 106.

* Ten points to be remembered about calcium and phosphorous. V. K. La Mer.—p. 110.

January dinner menus for the general hospital patient. N. T. Wolfe.—p. 114.

TEN POINTS TO BE REMEMBERED ABOUT CALCIUM AND PHOSPHOROUS. The author gives an excellent summary of the salient features of present knowledge regarding the rôle played by calcium and phosphorous in nutrition.

Practical Home Economics

Vol. 11, November, 1933

Equipment problems for the small school lunch room. D. Stackhouse.—p. 328.

Vol. 11, December, 1933

Planning and equiping the unit kitchen. D. McCray.—p. 349.

School food problems in the midst of plenty. M. Pattison.—p. 360.

Building efficient work units in the school cafeterias. F. I. Byerley.—p. 361.

Trained Nurse and Hospital Review

Vol. 91, December, 1933

Hot school lunches in rural Rhode Island. D. K. Sutcliffe.—p. 541.

Vol. 92, January, 1934

* Carbohydrate classification of fruits and vegetables. A. M. Gurtler.—p. 54.

CARBOHYDRATE CLASSIFICATION OF FRUITS AND VEGETABLES. A complete and accurate study was made of the carbohydrate classification of fruits and vegetables used in seven of the leading hospitals in this country. The author makes a plea for a standard classification as a time saver and also as an aid in instructing patients, many of whom receive instructions from different institutions.

ASSOCIATION PROGRESS

THE PRESIDENT'S MESSAGE

The midwinter meeting of the Executive Committee was held at the Blackstone Hotel, Chicago, on January 6 and 7, with all except the California member, Jean M. Stewart, present. It is this session which enables the Executive Committee to take responsibility for the activities and progress of the Association, since without it the burden of many decisions must otherwise rest with the President. However, there are other results of equal significance. The entire personnel of the committee gets a complete and vivid picture of all matters pertaining to the Association. This means added enthusiasm and better understanding of the constructive work accomplished each year, instead of individual members working alone, eager and intent, yet uninformed of the responsibilities carried by other members of the Executive Committee. New matters that give promise of being far-reaching in their effect on the future progress of the Association require well-considered discussion as well as the pooling of knowledge and experiences for best results. The opportunity for each member to report progress is always stimulating and encouraging.

Since the JOURNAL Editor and the National Publicity Chairman also need to be thoroughly informed of trends and accomplishments, as well as to sense the spirit of the group, they should be required to attend all executive sessions. It may seem expedient to include the Program Chairman, as well.

It is my conviction that the midwinter session of the American Dietetic Association Executive Committee—if held not later than the early part of January—undoubtedly brings about the most widely applicable results of any of the three possible sessions. Of course the first meeting of the newly elected and appointed Executive Committee is essential to give the foundation for the midwinter session. Thanks to the office of President-Elect, this first meeting of the committee, when held immediately following the annual meeting, can contribute a vital and significant start for the year's activities. Your President, who has intimately familiarized herself with association activities and problems throughout the preceding year, should be in a position to outline her plans for the year and to initiate action immediately. But regardless of carefully made plans, and even if all appointive offices have been filled so that a full attendance of the Executive Committee is realized, section and committee plans can hardly be more than formulated at the time. Problems requiring discussion to insure wise decisions cannot have presented themselves the first day your new Executive Committee takes office. It is much more difficult to handle grave questions of policy or procedure by Executive Bulletin than by discussion. In addition, the entire committee personnel are weary after the four or five day sessions of the annual meeting. These facts lend weight to the belief that the midwinter session of the Executive Committee is the one in which the most important and widely applicable decisions may be made for the Association. The following results of the January executive session will be of interest to you.

Inspection Chairman. The Association has been particularly fortunate in having Mary DeGarmo Bryan as inspection chairman during the past three years. Mrs. Bryan will not be able to make the actual inspections this year, but has kindly consented to take much of the real responsibility for this year's inspections, and will continue to check, with approved course heads, any changes in the courses now offered. All correspondence, therefore, pertaining to the progress of these courses, should go to Mrs. Bryan until the new inspection chairman begins her duties on July 1.

Administrative Council. In order that past presidents may be rightly recognized for their contribution to their profession, and that their wisdom and judgment in respect to Association activities, acquired through office, may continue to be available to the

Presidents, it was decided to form an Administrative Council to consist of all past-presidents. It is hoped that the Council may become a permanent body if the first year works out successfully.

Journal Support. It was proposed to increase support of the JOURNAL through four channels. (1) Perfecting the organization of the JOURNAL Board by making future appointments on a basis of general interest and geographic location. (2) A new activity to be known as the "Journal Current Comment Project," designed to support the Current Comment section of the JOURNAL with increased general membership participation. Four national chairmen are to be appointed, upon recommendation of the JOURNAL Board, to represent the four major activities of the Association. Each of the above four chairmen will in turn appoint a state representative in each affiliated state association. Each of the state representatives of the four projects will write a current comment article of a given length and topic for each issue of the JOURNAL. The National Chairman, in each instance, will select the three best articles received from her committee and the JOURNAL Editor will subsequently decide upon the one best suited for publication. Thus, in each JOURNAL, four current comment articles pertinent to our four major interests will appear. (3) A new responsibility was planned for each of the four sections, the "Journal Abstract Project." Each section will assume responsibility for appointing a chairman to abstract publications pertinent to the section's interest. Once appointed, the abstract chairmen will be responsible to Kathleen M. Lewis for abstracts to appear in the Current Literature section. This project requires a particular type of ability which we are desirous of discovering among our general membership. (4) The National Publicity Chairman has added a new responsibility to her already influential tasks—that of heading up the News Notes section of the JOURNAL. She feels that one aspect of publicity, telling the Association about itself, is just as important as telling the public about the Association. Hereafter, each state publicity chairman will be guided by Esther Kimmel, National Publicity Chairman, as to the content of her state's news items.

Placement Bureau Board. This Board will in time be a most significant factor in maintaining the standards of our profession and in securing recognition of the excellent background and experience which American Dietetic Association membership has come to signify. It was voted that all future appointments to the Placement Bureau Board should be made from well-defined geographic districts. Thus, upon the expiration of the term of appointment of a member from a given geographic center, the new appointee would be selected from that same district. Each member of the Placement Bureau Board will now be chairman of a placement committee whose size will be dependent upon the number of affiliated state associations represented by her geographic district, since she will appoint one member from each state group. The Central Placement Bureau will keep each Board member informed of registrants from her district, while the state placement members will inform their Board member of openings and available dietitians within their state as well. It is to be expected that this re-organization will require sympathetic interpretation to affiliated state associations and directors of approved student dietitian courses, so that it may develop loyalty to the profession which in time will result in a real *esprit de corps* throughout the entire Association.

QUINDARA OLIVER DODGE.

ONE NATIONAL PROJECT

At the recent meeting of the Executive Committee in Chicago, Esther Kimmel, national publicity chairman, suggested that one unified national project, each year, would present excellent possibilities for publicity. After some discussion, it was decided to coördinate the efforts toward emergency relief of the various local and state associations into one national project for 1934, "Emergency Relief." Dr. Kate Daum attended the conference called by the Secretary of Labor in Washington,

D. C., last October, and in view of her knowledge of the general plan, and her interest in the relief situation, her appointment by Mrs. Dodge was unanimously approved.

This national project is to be representative of the emergency relief actvities of each of the four national sections, as well as of the various local and state groups and individual members of the Association. It would assist in the development of plans and the attainment of tangible results, if Dr. Daum were informed regarding relief work in which members of the Association participate throughout the United States. At the coming convention, Dr. Daum plans to give a composite picture of the national Association's progress in the relief work of 1934.

In December, 1933, Harry L. Hopkins, Federal Emergency Relief Administrator, formulated certain recommendations to be sent out to each state relief administration, in which it was suggested that the federal office be provided with the name and previous professional experience of each state's nutrition director. It was further suggested that if there were no trained person serving in the capacity of nutrition director, that certain authorized groups be requested to supply a fully qualified food and nutrition specialist, with a working knowledge of conditions throughout the state. Her duties would be to circulate food and nutrition information to meet the special needs of relief families, and of other financially-handicapped families not on relief in the state; to give special assistance in planning for the feeding of families in transient service centers and workers in Civil Work Camps; to assist schools in their emergency school lunch programs, providing educational and illustrative material to the local home economics teachers in carrying on nutrition campaigns in the public schools; and to give assistance in whatever way services may be needed in sponsoring self help programs that deal with garden production and preservation of food.

The state of Iowa was one of the first to appoint a nutrition director. Lola Schmidt, a former student of Dr. Daum's, has been actively engaged in collecting illustrative material for nutrition instruction, working on family budgets, conferring with social workers who come to the nutrition office and formulating plans for a nutrition survey of three counties.

Missouri is also busy, with an elaborate program and nutrition workers in many of the counties.

Many state and local groups have been active for several months on the relief program. Mary Barber writes:

"Here in Battle Creek, [Michigan] the head of the relief work appointed a committee of three women, two of whom have had dietetic training. Dr. Helen Mitchell is the chairman of this committee. Our first step was to study the items on the food order which were given to the poor families in this county. We found that the food was inadequate from many standpoints. The small families received enough calories, but the large families did not. All lacked sufficient proteins, minerals and vitamins. We revised this food order and now have one which is adequate in every respect. The one criticism of it is that many of the families do not know how to use the amount of milk which is given them and need education along this line.

"These people come to a central office to receive their food orders. Through Miss Margaret Ritchie, Dean of Home Economics, Battle Creek College, we have arranged for students to spend some time at this office talking informally to the people who are there. This undoubtedly will be helpful to the women and they can gain many suggestions for using the food which they receive from the relief commission.

"This same committee also has helped with the Community Center opened for the purpose of feeding the unemployed single men of the city. A hotel has been rented for this purpose and the dining room and kitchen facilities are fairly good. Three meals are being given to the men and between 250 and 275 are fed each meal. Our committee helped to organize this project, helped to plan the meals, and assisted in regulating the expense. At present, the men are being fed for about 26 cents a day. This includes all the salaries paid to the

cooks, dishwashers, dining room help, the heat and fuel for cooking and electric lights."

Miss Barber adds that copies of the food orders before and after the Nutrition Committee began work, copies of some of the menus now in use at the Community Center, and copies of the recipes worked out by the Home Economics Department of Battle Creek College and distributed to the women who are receiving food orders, can be obtained upon request.

Many other state and local associations have been actively assisting in the relief work for some time past. Reports of such work appear in the news section of this JOURNAL, notably in Detroit, Minnesota, Richmond, Philadelphia, and among the Tri-State group. The Greater New York Association has been directing much of their association funds into relief channels for two or three years past, and members have been active on relief committees.

It was the consensus of opinion of the Executive Committee of the National Association that all low cost dietary recommendations prepared by dietitians for relief organizations should be approved by medical groups.

Dr. Ruth Okey of the University of California has prepared a series of rating cards to be used in appraising the food purchased by relief families, according to a letter from Jean M. Stewart to this JOURNAL. These score cards simplify the final survey of nutritional values, and it is hoped that they may appear in the May issue of the JOURNAL.

As the JOURNAL goes to press, Eleanor Wells writes to say that a nutritionist has been appointed to head up food study, advice and distribution for people on the Rhode Island unemployment relief under the C. W. A. Rena Simonini, a graduate of Rhode Island State College, and the course at Massachusetts General Hospital, has been appointed to this post.

1934 MEMBERSHIP CAMPAIGN

The Membership Campaign, Effie May Winger, Chairman, will be carefully organized and actively promoted over a far-flung territory in order that the resulting membership of the whole association may be representative of our four major interests.

The awakened interest of our members, through the increased activity of the Community Education Section under Laura Comstock as its first chairman, provided a fresh impetus to the entire association, as well as bringing in new members interested specifically in nutrition as it affects community health and well being.

The scope of the national and state administration sections has been so broadened that we find them effectively serving the management problems in all types of hospitals, sanatoria, school lunchrooms, dormitories, college cafeterias, as well as hotels and restaurants. Papers in the January, 1934, JOURNAL from the University of California and the Western Washington Dietetic Association, as well as the development of the Food Ledger, attest the value of this broader approach for our members. Added to this, the Association is wholeheartedly encouraging the development of administrative student dietitian courses, in addition to the established hospital student dietitian courses.

Every prospective member with a hospital background is fully aware of the value and significance of American Dietetic Association membership. Active membership confers upon the recipient an enviable position in her chosen profession because of the high standards set up in 1926 and adhered to by the Membership Committee in passing upon all applications. The hospital member is also aware of the many other advantages and incentives such membership brings, so that we find, even in this period of economic stress, that our membership showed an increase last year when most professional associations showed resignations exceeding new members.

Unfortunately, outside of the hospital field professional activities are less standardized at those points where the well-defined standards have enabled the hospital dietitian to begin building her department activities. The codes being developed under the urgency of the NRA are necessitating uniform standards for the hotel and restaurant asso-

ciations but no group is doing this much needed work for college dormitories and school lunchrooms.

There has been a wholesome trend toward an appreciation of the contribution preventive medicine may make to our daily life. However, many women responsible for well-balanced, properly prepared meals for the healthy adult are unaware of the advantages of American Dietetic Association membership, or of the contribution they in turn can make to the Association.

Plans for the Campaign include approaching the following groups:

1. Directors of approved student dietitian courses
2. Graduates, during 1933, of all A.D.A. approved courses
3. Presidents of all affiliated state associations
4. College department heads whose graduates are accepted in A.D.A. approved student dietitian courses
5. Private school and university dormitory managers
6. School lunchroom directors
7. Restaurant managers or owners
8. College cafeteria managers

Plans also include the appointment, by the Membership Campaign Chairman, Effie May Winger, of an influential member in each affiliated state association to work closely with the National Chairman while at the same time building up the campaign within her state along the lines individual state conditions may warrant.

HERALD TRIBUNE NUTRITION SERIES

The Executive Committee of the American Dietetic Association recently approved the publication of a series of four nutrition articles to appear in the New York *Herald Tribune Magazine*. The first number in the series, "Pre-natal Feeding," by Dr. Kate Daum, University of Iowa Medical School, appeared February 25. The second in the series, "The Truth about Spinach," by Mary P. Huddleson, editor of the JOURNAL, will appear shortly after. Dr. Martha Koehne will be responsible for the third paper, "Preventing Secondary Anemia." The subject of the final paper, by Dr. Bertha Bisbey, will be "Vitamins Up To Date." The suggestion for the preparation of this series came from Miss Mary Day Winn, assistant to Mrs. William Brown Meloney, editor of the *Herald Tribune Magazine*. This has been one of the most noteworthy opportunities which the Association has had for constructive publicity. Each one of the series will be introduced by Dr. Mary de Garmo Bryan, who will give a brief introduction of the Association, the author, and her subject.

EXAMINATIONS IN DIETETICS

The January, 1934, issue of the *American Journal of Nursing* publishes an article on examinations in dietetics, by Mary de Garmo Bryan and Ruth Bailey. Introductory comment by Isabel M. Stewart, chairman of Education Committee, National League of Nursing Education, mentions the long continued collaboration, between the Education Committees of the American Dietetic Association and the National League of Nursing Education, on the problems relating to the teaching of dietetics to student nurses. Miss Stewart calls attention to the present weaknesses in many State Board questions with regard to the subject of dietetics. She feels that examining boards and nursing school instructors will find Mrs. Bryan's and Miss Bailey's paper exceedingly helpful. The paper states that although the *Curriculum* of the National League of Nursing Education recommends 45 hours of nutrition and cookery, with 15 hours lectures, and 15 laboratory classes of 2 hours each, only 16 states out of 43 meet this standard. Four states require more time than that suggested by the League, 17 require less, and 5 reported no definite time requirements. At the present time, only 21 states require that teachers of dietetics have a degree in foods and nutrition experience, while 16 states accept any dietitian employed by the hospital. In 5 states, nurse instructors teach dietetics, while 4 report that high school home economics teachers are employed. At the present time but 5 of the 43 states require that the dietetic instructor be a member of the American Dietetic Association.

The paper covers the present type of examination material for the nurse, and concludes with several varieties of objective questions, with a corresponding key. This paper discusses but one of the many important educational activities in which Mrs. Bryan is interested, and her progressive and non-compromising ideas and ideals with regard to the student nurse as well as the student dietitian have done much to advance the status of each.

NEWS CONCERNING APPROVED COURSES

In November, 1933, Mrs. Dodge appointed Mary Louise Bone of the Starling-Loving Hospital, Columbus, Ohio, chairman of the committee to make recommendations on the correct term to use for students taking approved courses. Up to the present time there have been many terms in use, such as "junior dietitian," "graduate student in the department of nutrition," "dietitian intern," "nutrition intern" and even "dietetics intern." Many preferred the term "dietitian intern," but there were numerous arguments against the use of this phrase. The gist of the opposing comments was that the word "intern" has a distinctly medical connotation. After some discussion of the matter at the recent Executive Committee meeting, it was unanimously voted to accept Miss Bone's recommendations and adopt the term "student dietitian" hereafter in referring to persons engaged in post-graduate hospital training in dietetics.

The group of hospitals in St. Paul and Minneapolis no longer comprise one affiliated group, but each city now has a group of its own.

Orange Memorial Hospital (New Jersey) is no longer one of the affiliated group of hospitals connected with the Hackensack Hospital.

KNOWING OUR NOTABLES

The JOURNAL plans to list in each issue under the above heading, commendable current achievements on the part of individual members that have been brought to the attention of the JOURNAL. Members who persist in wishing to "blush unseen" cannot expect to appear here.

Our nominations to this issue's galaxy of fame are the following: Lute Troutt of the University of Indiana Hospitals for her timely work on the feasible means of promoting cleanliness in food handling—a practical answer to the challenge raised by the amebic dysentery outbreak. Miss Troutt's written summary of this work will appear in the May JOURNAL. Mary Barber of the Kellogg Company, for her excellent summary of the relief work in her own community. Colleen Cox of the Riley Hospital, Indianapolis, who was appointed by Miss Troutt to prepare diet therapy abstracts for the JOURNAL, and who promptly and accurately prepared and despatched these abstracts for this issue of the JOURNAL. Kathleen Lewis, assistant editor of the JOURNAL, and administrative dietitian of Johns Hopkins Hospital, who modestly states that she has been called West "to do a little dietary survey for Dr. Allen Krause at The Desert Sanatorium in Tucson, Arizona." Frances Berkeley Floore of St. Luke's Hospital, Chicago, not only for actively assisting in relief work through serving on committees in Chicago, but for writing up her experiences which will be published in a coming issue of the JOURNAL, Catherine L. Newton, associate professor of home economics at the University of Georgia for getting ideas from the JOURNAL, as attested by the following excerpt from her letter to Miss Lenfest: "We are trying to interest the heads of our institutions of higher learning in Georgia in securing trained dietitians to be in charge of their dining halls. We believe that the last issue of the JOURNAL should be of particular interest to them in this connection. There are sixteen such institutions, and we would prefer having the journals sent directly from your office. We want them to know something of our professional organization as well as the subject matter of the articles in the JOURNAL." Finally, Dr. Marie Mount, Dean, College of Home Economics, University of Maryland, who has been appointed secretary of the special committee to study the Tugwell Bill and to make recommendations to the Women's Joint Congressional Committee concerning the action the special committee advised them to take.

NEWS NOTES

The American Dietetic Association 1934 Meeting. Mrs. Quindara Oliver Dodge, President of the American Dietetic Association, was the guest at the dinner meeting of the District of Columbia Dietetic Association at the Dodge Hotel on February 23.

Plans for the American Dietetic Association Convention, to be held at the Mayflower Hotel, Washington, D. C., the week of October 14, 1934, have been discussed at length and the local committee chairmen, imbued with exceptional interest and enthusiasm, are busy with plans for a meeting in the best traditions of the city's past performances. Washington, D. C., dietitians were responsible for two of the most professionally instructive and enjoyable meetings in the past—1922 and 1928. The local association extends a hearty welcome to the members of the American Dietetic Association and their friends to visit Washington during the week of October 14.

The following local committees have been appointed: local arrangements, chairman, Ruth Atwater, National Canners Association, 1729 H Street, vice-chairmen, Grace Bulman, Veterans Administration, and Mabel Ashenfelter, 2124 I Street; trips, chairmen, Mildred Parker, chief dietitian, St. Elizabeth's Hospital, and Blanche Fickle, chief dietitian, Gallinger Hospital; hospitality, chairman, Mary A. Lindsley, manager, Dodge Hotel, Rowena Roberts, chief dietitian, Sibley Hospital, Kathryn Durnell, 2124 I Street; tickets, Agnes Kacerozsky, chief dietitian, Mount Alton Hospital; housing of colored members, Georgette White, chief dietitian, Freedman's Hospital.

In view of the possibility of having Mrs. Franklin D. Roosevelt as a dinner speaker at the coming meeting, a recent news item in the *Boston Transcript* is of particular interest. According to the *Transcript*, a visit made by Mrs. Roosevelt to a school lunch room in Washington, D. C., supported by relief funds, will result in the appointment of a competent dietitian to take charge of the food and make drastic changes from the food now being served to the children. The situtation was brought to the attention of Mr. Harry S. Hopkins, Federal relief administrator, who signified his intention of appointing a dietitian.

Mail sent to the following members has been returned, unclaimed: Mrs. Sylvia B. Lystod, Mrs. Marion G. MacLean, Mrs. Esther McCormick, Vassa Lambertson, Helen Noyes, Myrtle Larson, Blanche H. Heninger, Helen R. Macrum, Janette M. Baird, Winifred Yates, Dorothy M. Froats, Emily Scott, Helen Paynter, Joan Rock, Reva G. Stuart Ward, Viola T. Glenn, Mabel Malcolmson, Ruth E. Williams, Rae Snow Gilmore, Stella Cylkowski, Lala J. Titus, Julia R. Hintzman, Elizabeth G. Clarke, Mrs. Kenneth F. Wilson, Doreen Aldwell, Leida Adamberg, Rosamond M. Lynch, Marjory S. DeForest, Mary M. Morhart, and Mrs. Theresa Lemmon Grossdan.

Dr. Henry C. Sherman, Mitchell Professor of Chemistry at Columbia University, is to be awarded, on March 9, the William H. Nichols Medal for 1934. This medal is to be awarded Dr. Sherman for his achievement in vitamin research, especially the development of quantitative methods for vitamins A, B, C and G. According to the announcement of the jury of selection for this award, Dr. Sherman's methods have been universally used in quantitative studies of the distribution of the vitamins in nature, in the determination of the vitamin values in foods, and in the conserving of vitamin values in preservation and processing of foods. Regarding Dr. Sherman's work with various collaborators, the announcement states, "Dr. E. N. Todhunter, working with Dr. Sherman, has just developed a new method of measuring vitamin A values upon isolated samples of material which will make possible the study of some new types of problems. With Drs. H. S. Hsiu, E. J. Quinn, P. L. Day and E. H. Miller, Dr. Sherman has studied the behavior of vitamin A under different conditions of temperature and hydrogen ion activity;

with Drs. A. A. Spohn, M. R. Gross and E. H. Burton, that of vitamin B; with Drs. La Mor, Campbell and Kinney, that of vitamin C." With Dr. A. W. Pappenheimer, Dr. Sherman discovered a method for the production and control of experimental rickets which became the basis for much of the investigation of vitamin D.

Two recent articles should be of interest to the readers of the JOURNAL: Hewlett, R. T., Prevention of diseases conveyed by food, Lancet 226: 145–50, January 20, 1934; and Wiehl, D. G., Diets of low-income families in Cleveland, Detroit, and Syracuse, Milbank Memorial Fund Quarterly 12: 35–46, January, 1934.

The American Public Health Association will hold its Sixty-third Annual Meeting in Pasadena, California, the week of September 3, 1934.

The University of Chicago Conference on Business Education will be held June 27 and 28. Its topic this year will be "Business Education and the Consumer." Attention will be focussed on the question of what can be done to make the consumer more intelligent in his economic activities.

E. R. Squibb and Sons, in urging consumers to insist upon products made by reputable manufacturers, repeats the warning given by George W. Mather, secretary of the New York State Board of Pharmacy, following a survey made by State inspectors who found that 44 per cent of the drug items purchased in cut-rate stores were of sub-standard quality. The first products studied by the New York State Board were peroxide of hydrogen, witch hazel, mineral oil, zinc oxide ointment and bay rum. Mr. Mather emphasized the importance to the buying public of taking the utmost precautions in buying medicinal and cosmetic products.

The Southern Medical Association, at its annual meeting in November, passed a resolution requesting the federal government to coöperate with educational and medical institutions in making a nationwide study of nutritional values of foods in various sections of the country, as an aid to combating dietary diseases.

The Hindenburg of the Kitchen. Her death in January brought to an end the remarkable career of Frau Hedwig Heyl, aged 83. In reviewing her accomplishments, the *New York Times* for January 24, notes that her cook book *The A B C of the Kitchen*, is to be found in practically every German household. Frau Heyl was the originator of the housewive's societies and schools for domestic science in Germany. Friend of two German empresses, during the World War she established soup kitchens in Berlin, and organized the National Women's Service League. She was head of the International Women's Congress in Berlin in 1904, and was said to have reformed the cooking in educational institutions in Germany and her colonies. Her greatest work of organization was the gigantic exhibition entitled "Woman in Her Home and Occupational Life", which took place in Berlin in 1906. In 1920 the University of Berlin broke a time-honored tradition by conferring an honorary doctor's degree upon Frau Heyl, a woman.

Eleanor Wells, director of the Y. W. C. A. School of Homemaking, Providence, sends an interesting little folder, telling of a child study course given in January and February under the auspices of her school. The lectures were given by a pediatrician, orthopedist, dentist and psychiatrist.

Esther Fisher, chief dietitian of St. Francis Hospital, San Francisco, studying the list of food supplies chosen by the Navy for its trans-Pacific flyers to take on their flight from San Francisco to Pearl Harbor, Hawaii, stated that the rations constituted a well-balanced diet. The five days' supply, which was issued in case of accident or delay, consisted of canned chicken and deviled meat, canned pineapple, tomato juice, milk chocolate, jam and coffee.

C. M. Whitaker, formerly of the American Hospital of Paris, recently wrote to the JOURNAL, mentioning the fact that the dieti-

tian is little known in France, and the dietary work at the present time is done by the doctor or left to the medical interns, who in turn give orders to nurses that, in many cases, have had but little dietetic training. However, Miss Whitaker states that a recent French medical journal approved a new word, "*dietiticienne*".

Ruth M. Kahn, chief of food clinic, Washington University Clinics, St. Louis, Missouri, sent to the JOURNAL office recently an interesting collection of recipes for allergy patients, who are sensitive to egg, milk, wheat, or all three. These recipes were devised after much experimentation in her food clinic, and are for muffins, quick breads, pastry, and cakes.

Alabama Dietetic Association. At the December meeting, Dr. Dennison, of the Jefferson County Health Laboratories, gave a comprehensive discussion of the new food and drug act. After the meeting the members were entertained at tea at the home of Helen Greene Bulmer.

January 20, the association met at Alabama College. Stella Harms was in charge of the program. Dr. A. W. Vaughn, head of the English department at Alabama College, gave an interesting and practical talk on "The Importance of Public Speaking", in which he included five recipes for transforming shy dietitians. He termed the dietetic profession an evangelical fellowship, and stated that the failures among dietitians were due to a lack of knowledge as to "who, when, where, and how". The dietitian should have a good "audience" sense and be fully certain of what she wishes to accomplish. Helen McLane, superintendent of nurses at the Norwood Hospital, discussed the dietitian's place in the hospital. Miss Denny, president of the Alabama Nurses Association, answered questions regarding the placing of dietitians in the hospitals throughout the state. She stated that finances had much to do with the few hospital dietitians in Alabama. She also said that the Southern doctor had yet to be completely educated to the value of the dietitian.

After the program, members and friends were guests of the College Home Economics Department at a most delicious buffet supper, followed by an interesting lecture on "International Relations" by Major C. Douglas Booth.

The members were very glad to have visitors from Mississippi State College for Women and from the Alabama Home Economics Association.

California Dietetic Association. The Los Angeles Section met at the Cedars of Lebanon Hospital, December 4, 1933, for the annual Christmas party. About 100 attended. Mr. Emmanuel Heiftz, who played several violin numbers, accompanied by Dr. Delavanti, led the group in singing Christmas Carols, and the Alvera Puppeteers presented several groups of puppets and explained their operation. Mrs. Rebecca Price of The University of Southern California gave a group of Christmas readings. After the program, refreshments were served and an informal hour of dancing was enjoyed.

The San Francisco Section met December 12, at the Hotel Bellevue, San Francisco, with twenty-three present. A five-course dinner was served to the members and guests, accompanied with enjoyable music by Charles Black at the piano and Marino Sensi, baritone. After dinner, Mrs. Lucile Waite, chairman, called the meeting to order, and the minutes of the previous meeting were read and approved. Lavern Owens lead the discussion on the bill of registration for dietitians in California. The general feeling was that at the present time the dietitians in the state would not be able to finance the maintenance of a board of examiners and other features involved with registration, and it was doubtful whether the benefits derived would be sufficient to warrant it. It was suggested that at a future meeting a representative from the nursing profession, or a similiar registered group, be asked to tell about the steps taken to introduce such a bill and the advantages derived therefrom.

Mrs. Waite told of the changes which were necessary in the section by-laws by the adoption of the new State Constitution. Adoption of the by-laws will be voted upon

at a future meeting. At the time of the December meeting they were in the hands of the committee on constitutions of the California Dietetic Association for approval.

It was approved by the majority that dinner meetings be held every three months.

The Santa Barbara Section met for its Christmas Party at the home of Ruth Bowden, chairman. After a short business meeting the members played bridge. Everyone enjoyed a Christmas grab-bag, which yielded interesting, inexpensive gifts. To conclude a delightful evening a tasty supper was served.

The San Jose Section held its regular meeting December 14, in the decorative arts room of the San Jose Teachers College. The chairman, Mrs. Julia Johnson, presided. Helen Mignon, head of the Department of Household Economics at the Teachers College, read the report of the committee on registration of the state association and led the discussion of this report. Several recommendations and revisions were suggested by the members, these to be submitted to the committee. Plans for the future meetings were discussed.

After the business meeting adjourned, the San Jose members entertained with Christmas games and supper. The class rooms and laboratories of the department, including the practice nursery and cafeteria, were open for inspection, and Helen Mignon conducted a tour through them for those who were interested.

The notes of the January and February Section meetings appear in the March issue of the *Bulletin* of the California Dietetic Association. Any person who is not a member of the California Dietetic Association may subscribe to the *Bulletin* for fifty cents a year on writing to Katharine Brown, editor, 511 South Bonnie Brae, Los Angeles, California.

Mrs. Leila Dornte, a member of the American Dietetic Association, has moved to Schenectady, New York, where her husband is employed in the research department of the General Electric Company. Although not a member of the State Association, Mrs. Dornte attended many of the meetings of the Northern Section.

Madeline Affolter, formerly at the El Mirasol Hotel, Santa Barbara, has moved to Philadelphia where she is private secretary to the assistant manager of a trust and investment house.

Genevive Moore has been asked to fill the vacancy as public relations chairman of the Santa Barbara Section due to the resignation of Mrs. Eloise Maxwell, who is no longer a resident of the state.

Chicago Dietetic Association, at the December meeting, elected the following officers for the year 1934; president, Kathryn McHenry, Edward Hines Jr. Hospital; vice-president, Margaret Cowden, Children's Memorial Hospital; secretary, Mrs. Carol Hess Saphir, University of Chicago Clinics; and treasurer, Sue Head, Michael Reese Hospital.

Katherine Mitchell of Michael Reese Hospital, who recently returned from a year's stay in China, spoke on her experiences there at the January meeting. A benefit bridge party, under the chairmanship of Frances Floore, St. Luke's Hospital, was given on the evening of January 24, at Passavant Hospital, which was successful not only as entertainment, but financially as well.

The February meeting was devoted to three talks on "Relief Diets and Their Effects", from the point of view of the infant welfare worker, Alberta Childs; the dietitian working with special diet problems, Sarah Elkin; and the family social worker, Mrs. Julia Dushkin. On March 9 the Chicago and Illinois associations will combine their annual meetings at a dinner in Chicago.

The Detroit Dietetic Association elected the following officers for the year: president, Helen A. Hunscher, Children's Fund of Michigan and Wayne University; vice-president, Sophia Halstead, Detroit Board of Health; secretary, Evelyn Foster, Henry Ford Hospital; treasurer, Alice Hardiman Smith, Charles Jennings Hospital.

The Community Relations Committee of the association has coöperated with the Wayne County Medical Society in setting

up market order lists and estimating the cost of special diets for the clients of the Detroit Welfare Department. The basis of calculations was "Family Food Budgets for Use of Relief Agencies" by the Bureau of Home Economics and Children's Bureau. The market order lists containing nutritional essentials in low cost foods are in the possession of dietitians and physicians.

Effort has been made to increase the influence of the association in the community, and the November meeting was therefore held in coöperation with the Home Economics Women in Business. A joint meeting was held in February with members of the Visiting Nurses Association. The latter group asked for a discussion of low cost diets and foreign food habits which are, of course, of particular interest to dietitians as well.

The Greater New York Dietetic Association held a closed business meeting on January 8, when all old and new business was discussed and cleared up for the beginning of the new year.

The Unemployment Relief Committee of the association held a meeting at the nurses' residence of the New York Hospital, February 1, 1934. The speaker was May Lamberton Becker, the reader's guide of the New York *Herald Tribune*, who talked about "New Books" with special reference to new novels. The tickets for the meeting sold for fifty cents, part of which was given to the relief fund. Refreshments were served by Miss Gillam who cordially invited the members to go through the hospital the same evening.

The regular meeting for the month of February was held February 5 at the Womens' University Club, New York City. The guest speaker, Dr. G. Douglas Taylor, assistant in medicine, Presbyterian Hospital and College of Physicians and Surgeons, Columbia University, discussed "Treatment of Chronic Arthritis."

Maryland Dietetic Association. A meeting of unusual interest was planned in December. Frederick Stieff, author of *Eat, Drink, and Be Merry in Maryland*, was to be the guest speaker, and Alma Bering, chief dietitian of Sheppard-Enoch Pratt Hospital, had invited the dietitians to an exhibition of foods canned at the hospital, and some food demonstrations. Much to the disappointment of all, the meeting had to be postponed on account of a severe sleet storm. The food exhibit was such an excellent idea that a description of it, written by one of the participants, will be published.

At the January meeting, the Association was most fortunate to have Mr. Stieff for the speaker. Alma Bering was hostess in the Pavilion at Sheppard-Pratt and served delicious refreshments at the close of the meeting. Mr. Stieff spoke on his purpose in compiling the "receipt" book and some of his experiences while collecting the data. Over sixty dietitians were present and all felt deeply indebted to both Miss Bering and Mr. Stieff for a delightful evening.

On December 13, Alma Bering, chief dietitian of the Sheppard-Enoch Pratt Hospital, gave a unique food exhibit tea for the patients of that institution. The auditorium of the reception building was transformed into an artistic exhibition room, with Christmas decorations. On one side of the room was a large table, attractively decorated with red and white checked gingham. On the table were arranged various types of canned food which had been preserved in the dietary department. A record attached showed that the dietary department had canned more than 1600 gallons of food from the surplus of the Sheppard-Pratt vegetable gardens.

In another section of the room, Martha Mannahan, educational director of the Baltimore Dairy Council, delighted the patients with a mechanical cow and an interesting story of milk.

On the stage, kitchen equipment was arranged where food demonstrations were given.

Elizabeth Twining, a Baltimore County, 4-H Club girl, who had won the State championship in canning, had an exhibit of her canned products and gave demonstrations of meat canning by steam pressure methods.

In another section, Anna Trentham, from

the Home Economics Extension Service, gave demonstrations in Christmas foods—cookies, cakes, and candies. The aroma from the freshly-baked foods added to the interest of the occasion. The patients displayed keen interest in the food and were delighted to have recipe sheets to "send home."

Miss Stenhaus, from New Zealand, who is a student dietitian at Johns Hopkins Hospital, illustrated normal diets.

All around the room various food products were displayed, and charts and books on cookery were arranged for the patients who were interested in reading more about diet and food.

The climax of the exhibit was reached when the patients arrived at a beautifully appointed tea table where tea was served. This food exhibit proved a most interesting, worthwhile activity. Music, with the exhibition and tea, presented an interesting method of treatment for the patients.

Carolyn E. Gunn has recently come from the Pan-Hellenic Hotel in New York to take charge of the cafeteria in the Roland Park Junior High School for the rest of the semester. Miss Gunn was formerly at the State Normal School at Towson.

During the Christmas holidays, Neva Lewis was married to Mr. James R. Coxen. Mrs. Coxen is dietitian at the Forest Park High School.

The following students who completed the post-graduate course in dietetics at the Johns Hopkins Hospital in July 1933, have accepted positions: Mary Elizabeth Rickards is associated with the Clinical Research Department of the Indianapolis City Hospital; Doris Johnson is an assistant dietitian at St. Joseph's Hospital, Milwaukee, Wisconsin; and Ella Jane Meiller is working for a few months at the Halstead Hospital, Halstead, Kansas.

Grace Hayden, who completed the post-graduate course in dietetics in October, 1933, is now in charge of the "Hostess Shop" at Eaton's Department Store in Toronto, Canada.

The staff and student dietitians of the Johns Hopkins Hospital Dietary Department had their annual Christmas dinner at the Baltimore Country Club on Wednesday, December 20, 1933.

Mr. and Mrs. William Henry Floyd have announced the marriage of their daughter, Annie Lee, to Mr. Alec Redfern on September 30, 1933.

Dr. and Mrs. J. R. Barry announced the marriage of their daughter Mary Margaret to Mr. Victor Ira Whittemore on December 27, 1933.

Mr. and Mrs. Abner James announced the marriage of their daughter, Elva, to Mr. John Frederick Kahrs on January 11, 1934.

The Massachusetts Dietetic Association. The speaker for November was Professor Edwin H. Schell of the Massachusetts Institute of Technology, who spoke on "Production Control." Mary A. Lindsley, managing director, the Dodge Hotel, Washington, D. C., was the December speaker; her subject "What does a personnel give to its work." After the meeting a reception to new members and student dietitians was held.

In January the association was addressed by Mr. James A. Hamilton, superintendent of the Mary Hitchcock Memorial Hospital, Hanover, New Hampshire, on "Hospital Organization—The Relationships of the Dietary Department." He had several interesting diagrams to show to the association.

The February meeting was addressed by Professor K. G. T. Webster, assistant professor of English, Harvard University, on "Medieval Foods."

Two field trips have been held for the student dietitians and it is hoped that they will be able to visit an ocean liner soon. The medical lectures for student dietitians have been held weekly, the first six at the Beth Israel Hospital, the second group at the Peter Bent Brigham, and the third is at the Children's Hospital.

New members of the association are Mae Halleck of the New English Deaconess Hospital, Beatrice Neary of the Metropolitan Hospital, and Anna Schultz of the Peter Bent Brigham Hospital. Beth Buirgy of the Massachusetts Eye and Ear Infirmary resigned as Corresponding Secretary and

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Constance Almy of the Beth Israel Hospital took her place.

The Minnesota Dietetic Association had its first fall meeting on the University Campus. Keen interest has been shown by high attendance at recent meetings of the association. Besides discussion and changes of the constitution, there have been many interesting talks. "Dietetic Treatment in Congestive Heart Failure" was discussed by Dr. Charles Hensel, Minneapolis. At another session, Clara Brown of the University of Minnesota suggested improved examination methods for student nurses. During the February dinner meeting, Margaret Drew gave an amusing talk on "Food Fads." Another speaker was Mr. Jean Vernet, former chef of the Nicollet Hotel and now with the Hormel Packing Company. During the Christmas season, the association supplied one Minneapolis and one St. Paul family with food and toys.

Marion Hodges, president of the Minnesota State Dietetic Association, has resigned from the U. S. Veterans Hospital, Fort Snelling, and is now at St. Andrew's Hospital, Minneapolis. Chrissa Wendt has taken a position as dietitian at St. John's Hospital, St. Paul. Minerva Worthman, formerly at Fairview Hospital, Minneapolis, was married in the early fall and is now making her home in New Jersey. Her place at Fairview has been taken by Alice Hambleton. Florence Richardson of the Public Employment Agency of Minneapolis, is a new member of the association.

The Pennsylvania State Dietetic Association will hold the Second Annual State Convention at Buck Hill Falls Inn, Pocono Mountains, on June 1 to 2, 1934, and an interesting program is being arranged.

Dietitians Association of Philadelphia. At the November meeting of the association, Helen A. Hunscher, Ph.D., of the Research Laboratories of the Children's Fund of Michigan, spoke on "Nitrogen and Acid-Base Mineral Storage in Children." The meeting was held at the Temple University Medical School with Dr. Marion Bell presiding. Home economics students from Beaver College, Drexel Institute, Temple University and the University of Pennsylvania were invited as guests. Dr. Hunscher's discussion of this important topic for dietitians was much appreciated by association members.

On November 28, Fred J. Cooper, a prominent jeweler in Philadelphia, discussed "The History of Sterling Silver." Members were invited to bring old English silver so that the value of their heirlooms might be determined and discussed.

At the December meeting, Mrs. Quindara Oliver Dodge spoke on "The Training of the Student Dietitian" at the Philadelphia General Hospital. Previous to the meeting, a tea was held for Mrs. Dodge at the Sarah Drexel van Rensselaer Dormitory of Drexel Institute. Student dietitians of the various hospitals in Philadelphia were invited, together with members of the executive committee, to meet Mrs. Dodge.

On January 9, Dr. Garfield G. Duncan, demonstrator in medicine, Jefferson Medical College, discussed "The Relationship of Nutrition and Insulin in the Diabetic and in the Undernourished Non-Diabetic" at Pennsylvania Hospital.

The Richmond Dietetic Association began its regular monthly meetings in October, 1933. The first meeting was held at Johnston-Willis Hospital. The work which had been started in the spring was resumed, the revised constitution adopted and the study of parliamentary procedure continued. Plans were made to attend the national convention.

In November the meeting was held at St. Luke's Hospital. At this meeting reports from the National Convention were given.

The December meeting was held at the Medical College of Virginia. Reports were given of the state meeting held in Norfolk, Virginia.

Through contacts with the C. W. A. nutrition workers employed in the city, the association has been able to plan a series of interesting programs for the winter and early spring months. In January, Mrs. Robbins who has recently completed her masters de-

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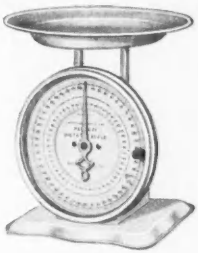

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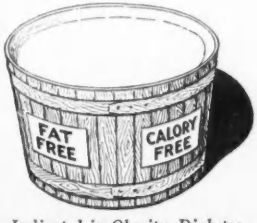

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gree in institution management at the University of Chicago and is now with the Instructing Visiting Nurses Association gave a symposium of the work she has begun with fifty-six of the families who come under the care of this organization. Marion Waters from the Children's Bureau of the State Department of Health reviewed the work she has begun with the juvenile institutions throughout the state.

These reviews were followed by talks from members of the association interested in non-hospital activities. An outline of the work carried on by home demonstration agents in the counties of Virginia, and some of the outstanding features of university food problems were given by Cecelia Swecher and Mrs. Woodward, respectively.

Katherine Leahy of the School of Social Service of the College of William and Mary has asked the association to conduct a day's nutritional demonstration for the social workers and laymen of the city. This project is now underway and it is hoped that through this demonstration we will be able to take an active part in meeting the nutritional demands in the city of Richmond.

The association is glad to announce that Margaret Bock, former assistant administrative dietitian of the Hospital Division, Medical College of Virginia, will attend Columbia University for the spring session, taking work leading toward a master's degree. Ruth Lake, who took her student training at the Medical College, is now in charge of the dietary department at the American Hospital in Paris, France.

The C.W.A. project now in progress at Medical College of Virginia permits addition of two graduate dietitians to the present staff. The department now has the opportunity of releasing some of the permanent staff to observe in other hospitals. Kathryn Heitshu, therapeutic and clinical dietitian, is spending two weeks in Philadelphia observing the food clinic and dietary department at Pennsylvania Hospital and others in that city.

The Tri-State Dietetic Association held its fifth annual meeting at Atlanta in February. Mrs. Quindara Oliver Dodge was one of the speakers. At a recent meeting of the West Tennessee Home Economics Association, Fairfax T. Proudfit spoke on "The Recent Advances in Nutrition."

Elizabeth Terrill is now doing nutrition work in Hamilton County, Tennessee.

The Tri-State Dietetic Association is distributing among its members an interesting mimeographed news letter, which is published twice a year. Through this letter the members can learn what is going on in the other states within the association, as well as in their own state.

The Virginia State Dietetic Association held its fall meeting in Norfolk, November 11. The business meeting was held at the Nurses' Home of the Protestant Hospital in the afternoon. Reports from the national convention were given at this time, as well as reports from all of the state section chairmen. Many of the problems arising in the state were discussed. A dinner meeting was held at the Monticello Hotel with Dr. William Wesley White, guest speaker, on "Diet in Relation to Dental Caries."

The spring meeting will be held in Richmond this April.

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WHO'S WHO IN THIS ISSUE

MARTHA KOEHNE, noted for her work on dental caries, was a contributor to the September, 1931, issue of the JOURNAL. DR. RUSSELL W. BUNTING is professor of oral pathology in the School of Dentistry, University of Michigan. He is the author of a text book on this subject and has been well known many years for his interest in the cause of dental caries and for his contributions to the solution of this problem. Since 1929, he has been director of the researches in this field that have been conducted at the University of Michigan under the auspices of the Children's Fund of Michigan. FAITH P. HADLEY has long been associated with Dr. Bunting in his researches. Her own contributions have been bacteriological, and concerned chiefly with Bacillus acidophilus.

HELEN B. THOMPSON received her doctor's degree at Yale University, having studied previously at the Kansas State College and at Columbia University. She taught in several New England colleges and at Kansas State College, is now professor and chairman of the department of home economics at the University of California at Los Angeles, and is the author of several published papers. ANNA SCHOLTZ (Mrs. M. Scholtz) is a graduate of the University of California at Los Angeles, and is managing her own home and doing volunteer social relief work.

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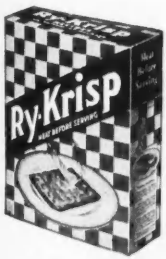

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